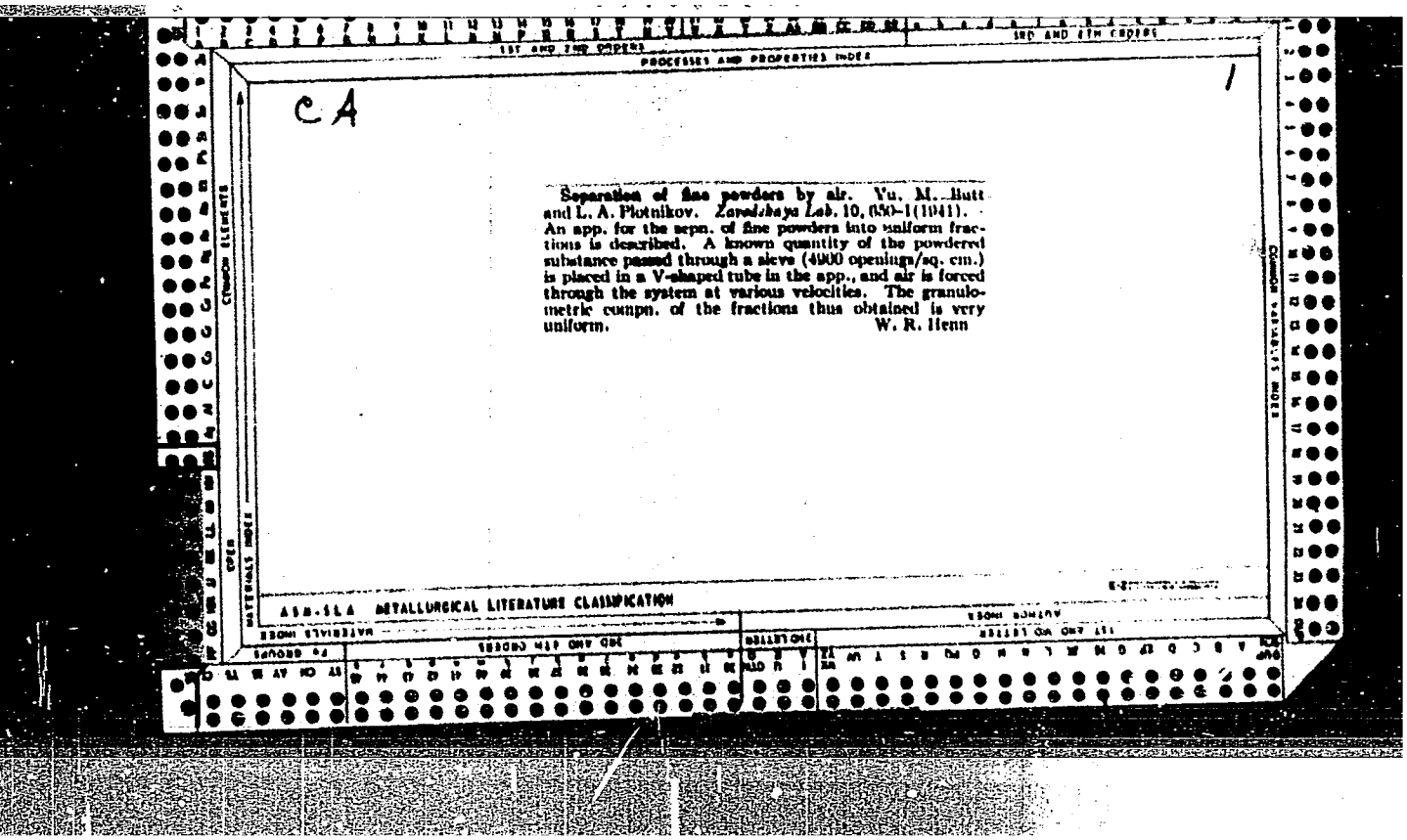
A. C. S.

Investigation of low-heat cements. Yu. M. [illegible]. *Trudy Mosker. Khim.-Tekh. Inst. Mendeleeva*, 1940, No. 8, pp. 82-83; *Khim. Referat. Zhur.*, 4 [6] 97 (1941).—The investigation was conducted with the purpose of choosing a suitable cement for the foundations of the Palace of the Soviets. The cement was to be distinguished by low thermal conductivity, sufficient strength, and resistance to salts. Portland and pozzuolanic cements having low heat conductivity were used for the foundations. M.Ho.

C

III - Cements.
Limes,
Plasters

Quantitative petrographic analysis of hydrated cements. V. N. YUNG, YU. M. BUTT, AND YU. N. NIKOLAEV. *Zavodskaya Lab.*, 10, 518-21 (1941); *Chem. Zentr.*, 1942, II, pp. 1817-38; *Chem. Abstracts*, 36 [9] 2178 (1944).—An apparatus with which it is possible to determine the petrographic composition of hardened cements quantitatively and accurately consists essentially of a microscope under which thin sections can be examined as usual with polarized light and which is provided with a sliding carriage to which a planimeter is rigidly attached. As the contours of the individual minerals visible in the polarized light are followed with the sliding carriage, the planimeter indicates the areas, and these are simultaneously recorded.



CA

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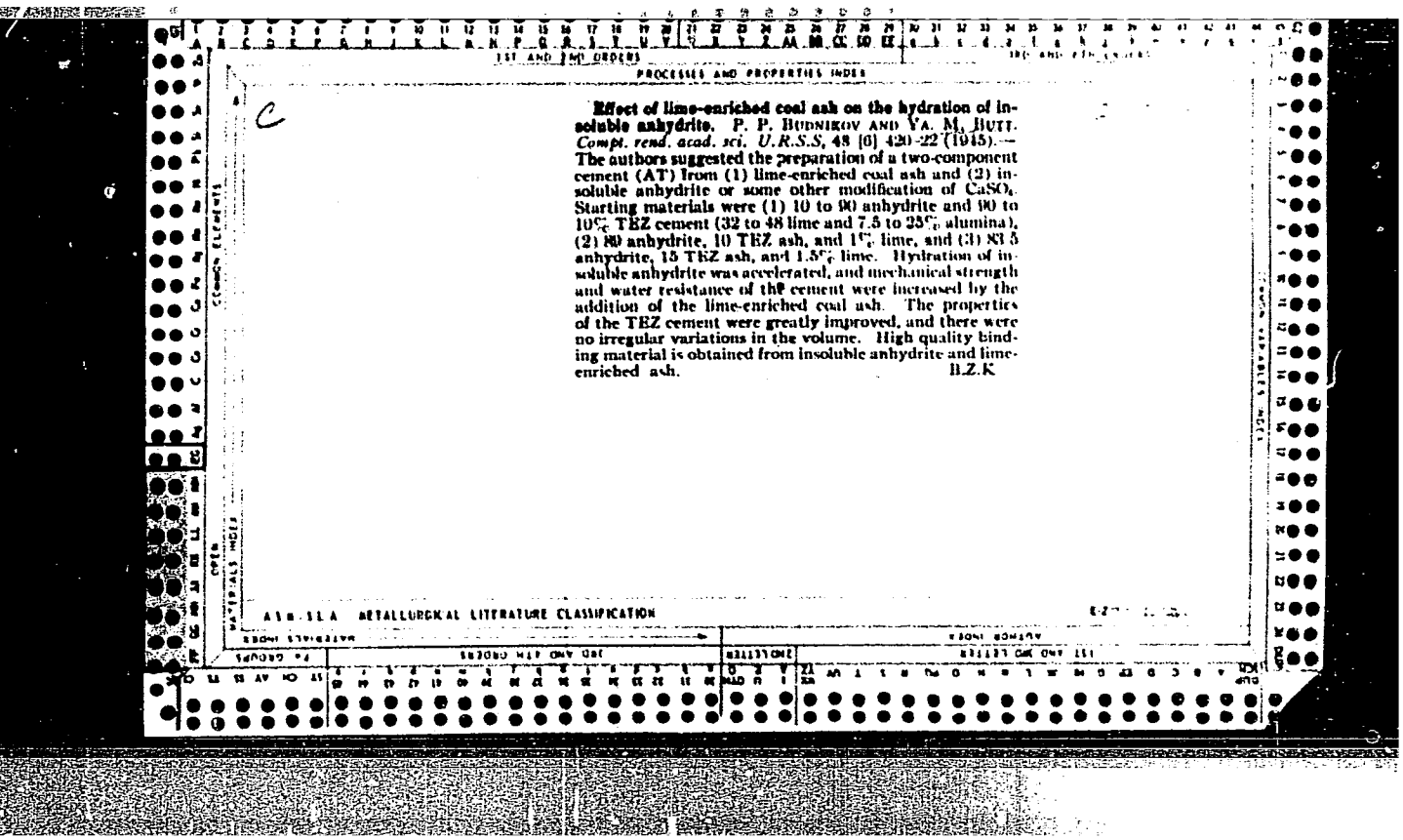
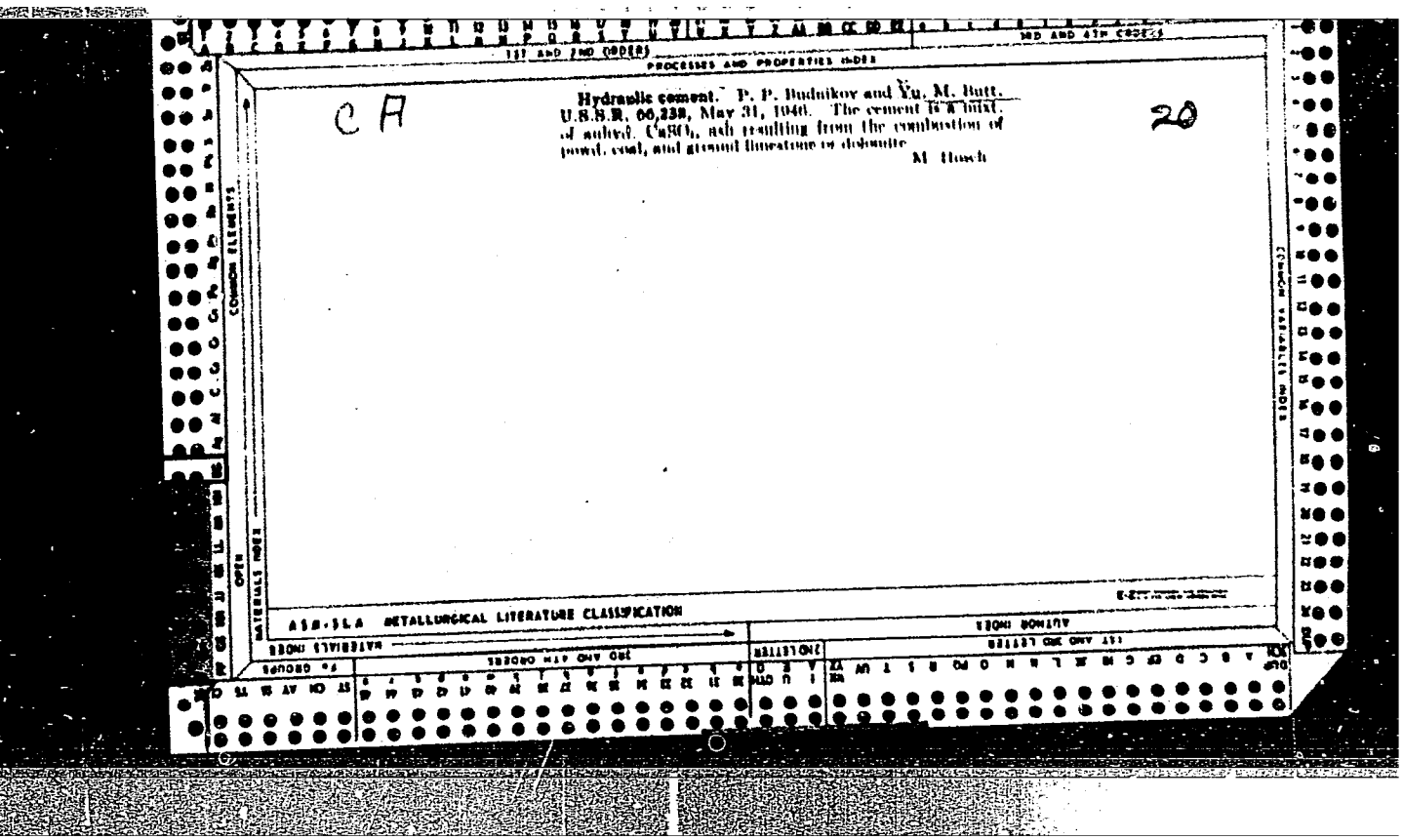
Separation of fine powders by air. Yu. M. Butt and L. A. Plotnikov. *Zavodskaya Lab.* 10, 650–1(1941). An app. for the sepn. of fine powders into uniform fractions is described. A known quantity of the powdered substance passed through a sieve (4900 openings/sq. cm.) is placed in a V-shaped tube in the app., and air is forced through the system at various velocities. The granulometric compn. of the fractions thus obtained is very uniform. W. R. Henn

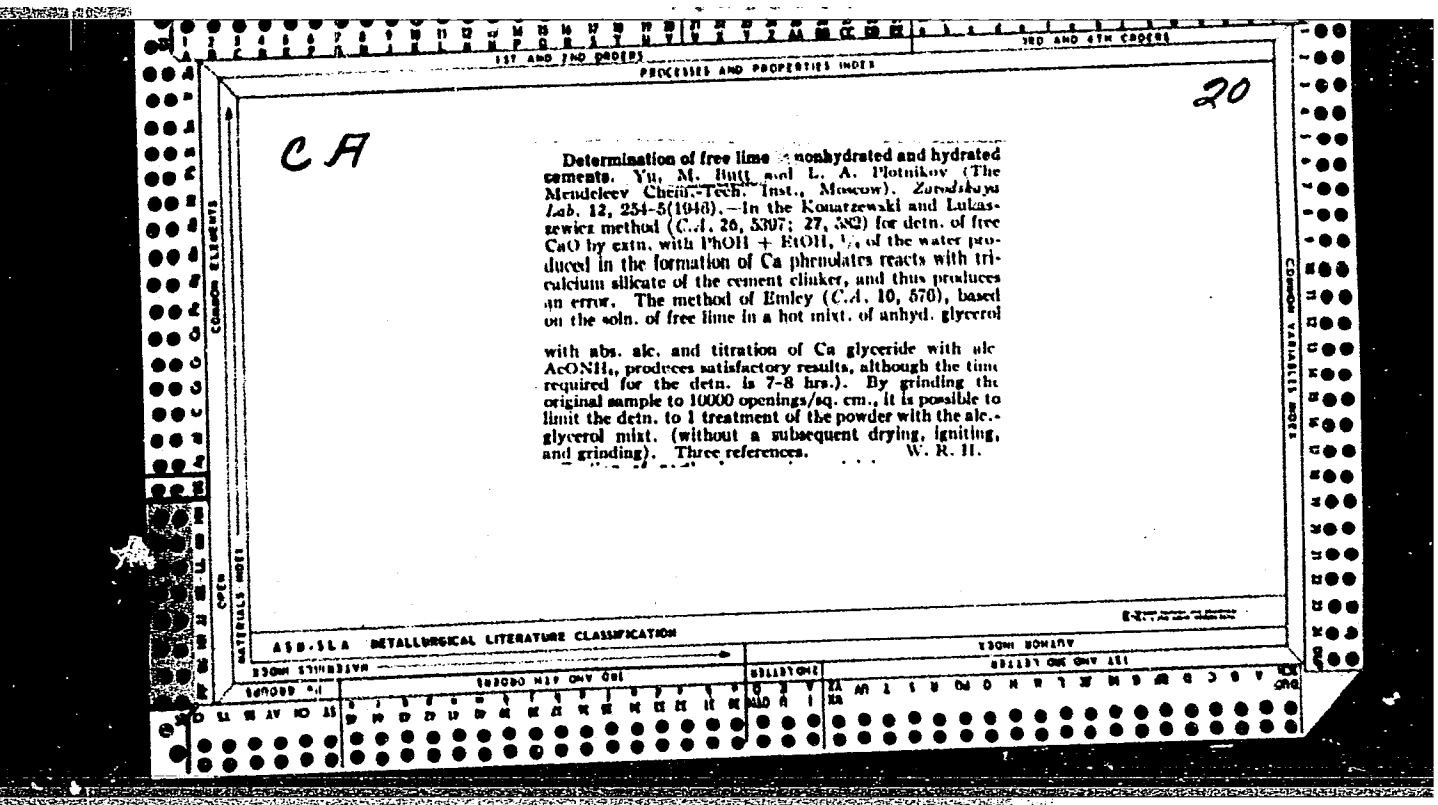


PROCESSES AND PROPERTIES INDEX

Effect of lime-enriched coal ash on the hydration of insoluble anhydrite. P. P. Budnikov and Va. M. Butt. *Compt. rend. acad. sci. U.R.S.S.*, 48 [6] 420-22 (1945).—The authors suggested the preparation of a two-component cement (AT) from (1) lime-enriched coal ash and (2) insoluble anhydrite or some other modification of $CaSO_4$. Starting materials were (1) 10 to 90 anhydrite and 90 to 10% TEZ cement (32 to 48 lime and 7.5 to 25% alumina), (2) 80 anhydrite, 10 TEZ ash, and 1% lime, and (3) 83.5 anhydrite, 15 TEZ ash, and 1.5% lime. Hydration of insoluble anhydrite was accelerated, and mechanical strength and water resistance of the cement were increased by the addition of the lime-enriched coal ash. The properties of the TEZ cement were greatly improved, and there were no irregular variations in the volume. High quality binding material is obtained from insoluble anhydrite and lime-enriched ash. B.Z.K

A S M - S L A METALLURGICAL LITERATURE CLASSIFICATION





CA

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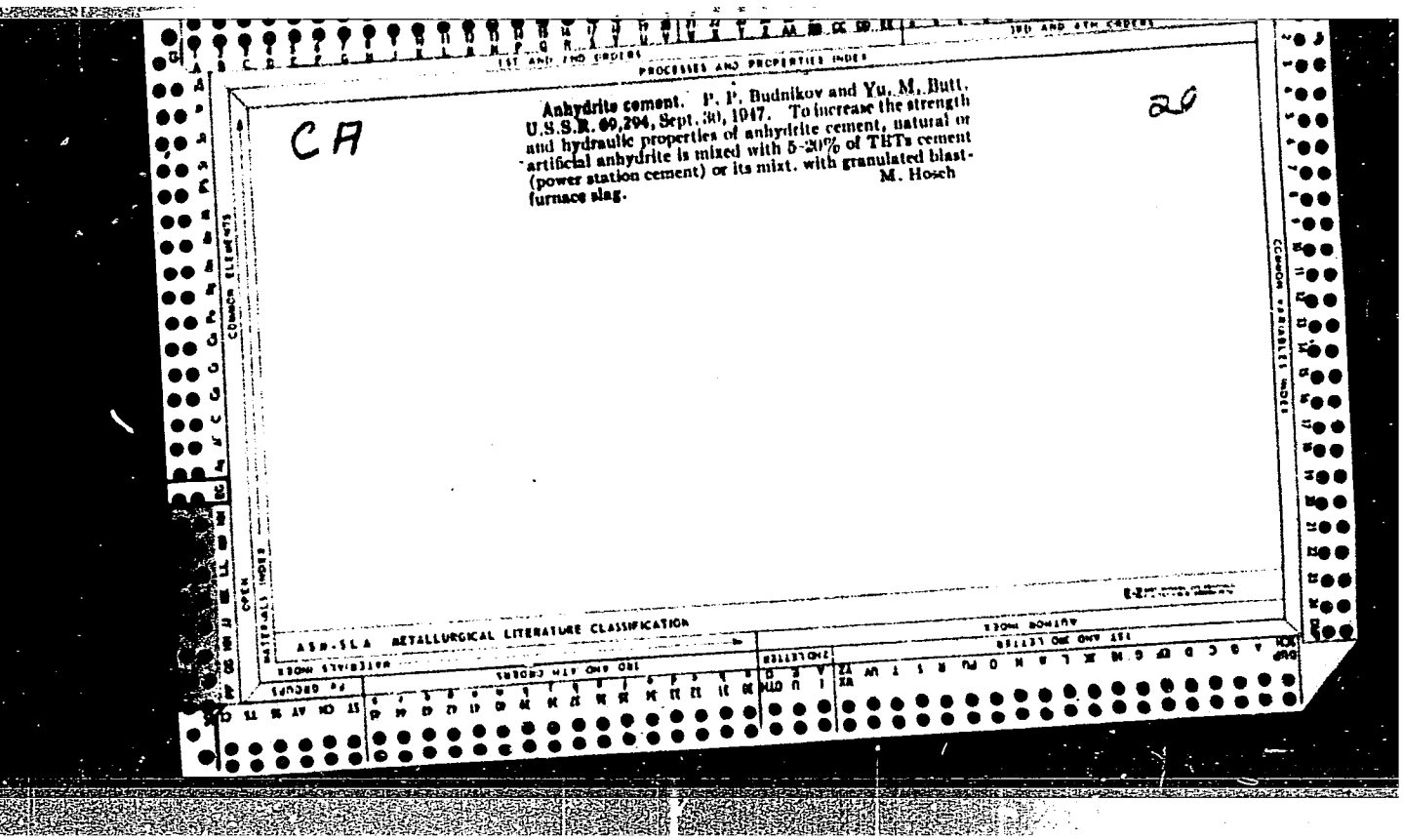
Determination of free lime in unhydrated and hydrated cements. Yu. M. Butt and L. A. Plotnikov (The Mendeleev Chem.-Tech. Inst., Moscow). *Zavodskaya Lab.* 12, 254–5(1946).—In the Kowatzewski and Lukaszewicz method (*C.A.* 26, 5397; 27, 382) for detn. of free CaO by extn. with PhOH + EtOH, ½ of the water produced in the formation of Ca phenolates reacts with tricalcium silicate of the cement clinker, and thus produces an error. The method of Emley (*C.A.* 10, 570), based on the soln. of free lime in a hot mixt. of anhyd. glycerol with abs. alc. and titration of Ca glyceride with alc. $AcONH_4$, produces satisfactory results, although the time required for the detn. is 7–8 hrs.). By grinding the original sample to 10000 openings/sq. cm., it is possible to limit the detn. to 1 treatment of the powder with the alc.-glycerol mixt. (without a subsequent drying, igniting, and grinding). Three references. W. R. H.



CA

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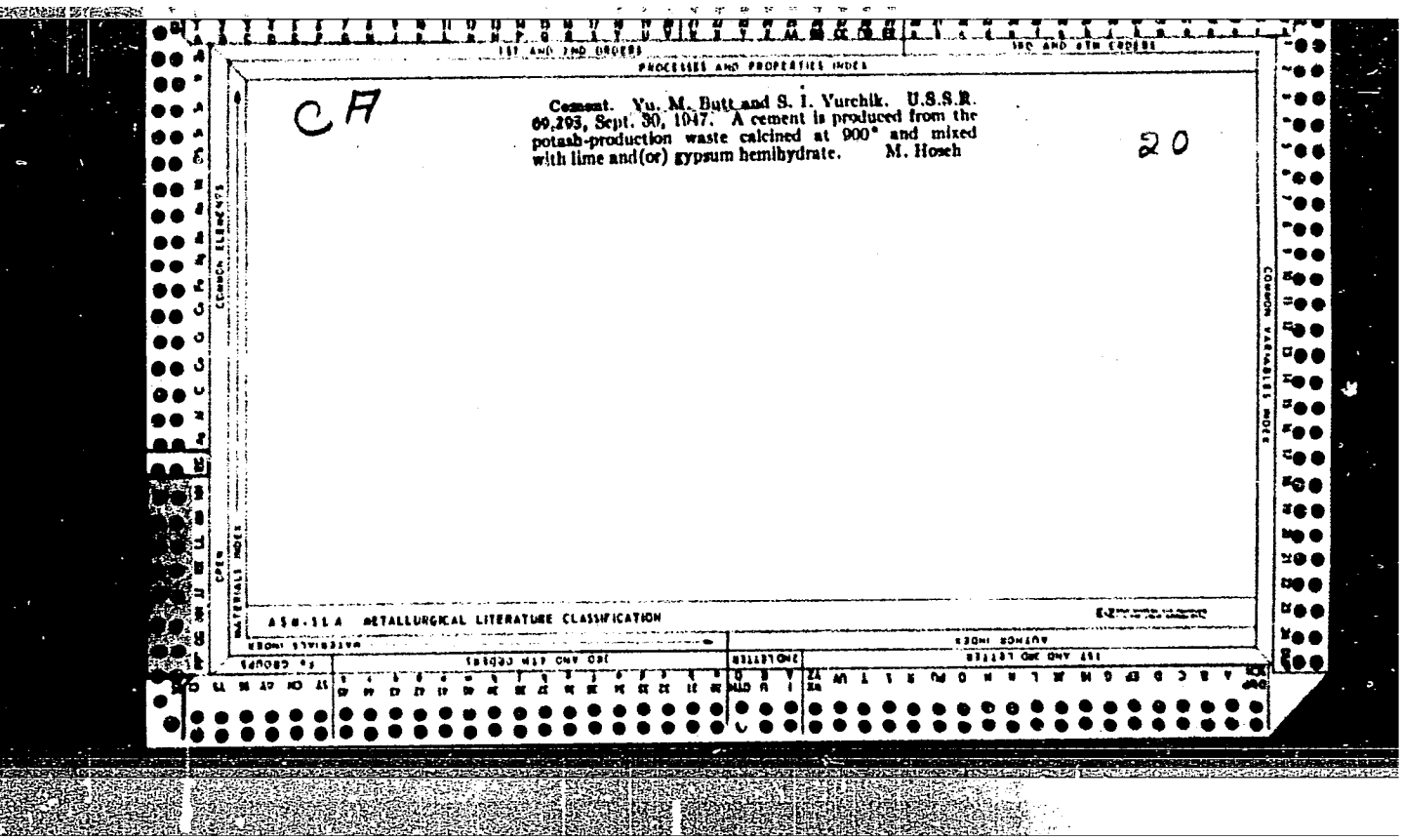
Anhydrite cement. P. P. Budnikov and Yu. M. Butt. U.S.S.R. 69,294, Sept. 30, 1947. To increase the strength and hydraulic properties of anhydrite cement, natural or artificial anhydrite is mixed with 5–30% of TBTs cement (power station cement) or its mixt. with granulated blast-furnace slag. M. Hosch



CA

Cement. Yu. M. Butt and S. I. Yurchik. U.S.S.R. 69,293, Sept. 30, 1947. A cement is produced from the potash-production waste calcined at 900° and mixed with lime and(or) gypsum hemihydrate. M. Hoseh

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BUTT, YU. M.

USSR/Cement
Lime

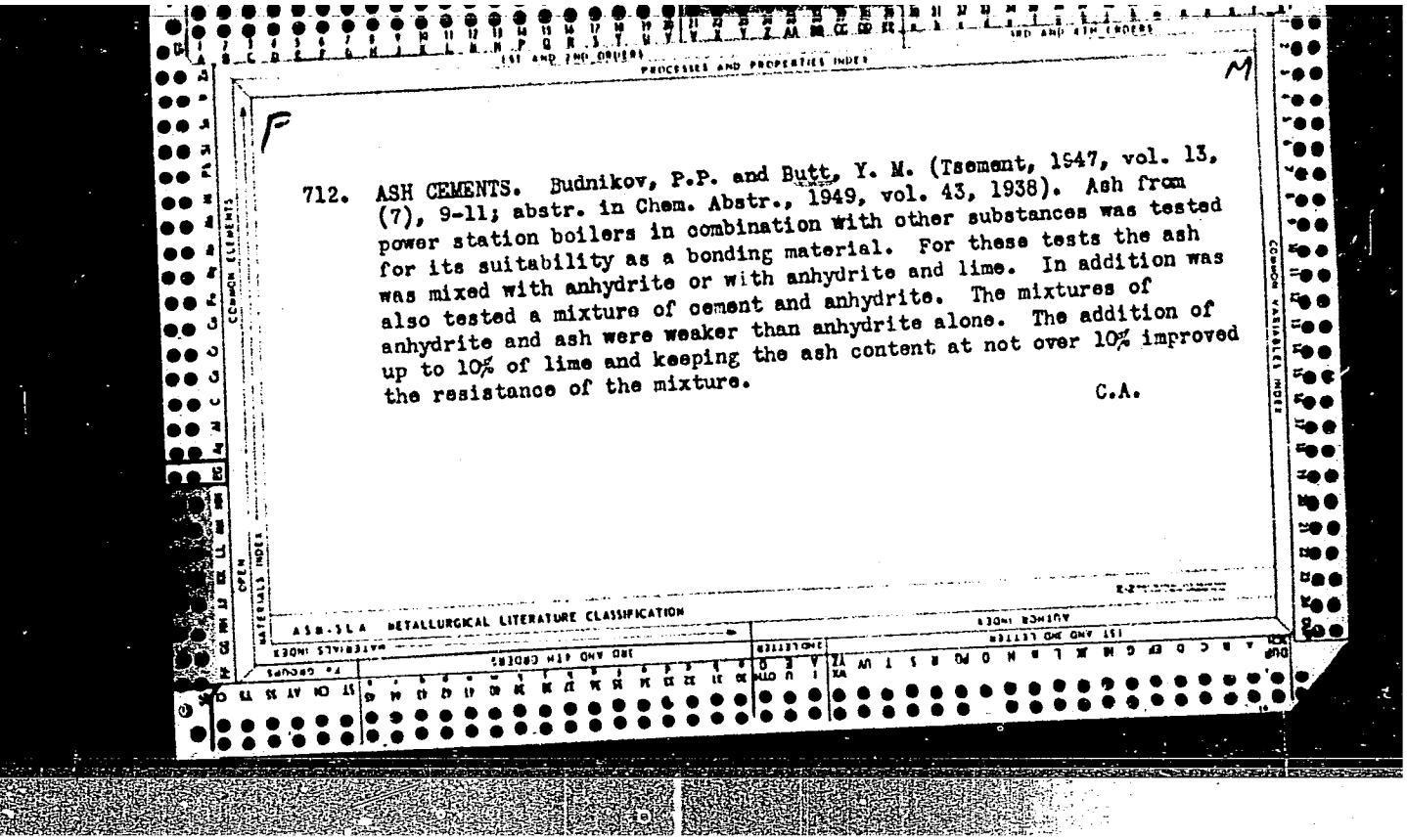
Mar 1947

"Utilizing Light Lime Marls as an Admixture for Portland Cement," V. M. Yurg, Yu. M. Butt, Dr of Technical Sciences, 5 pp

"Tsement" No 3

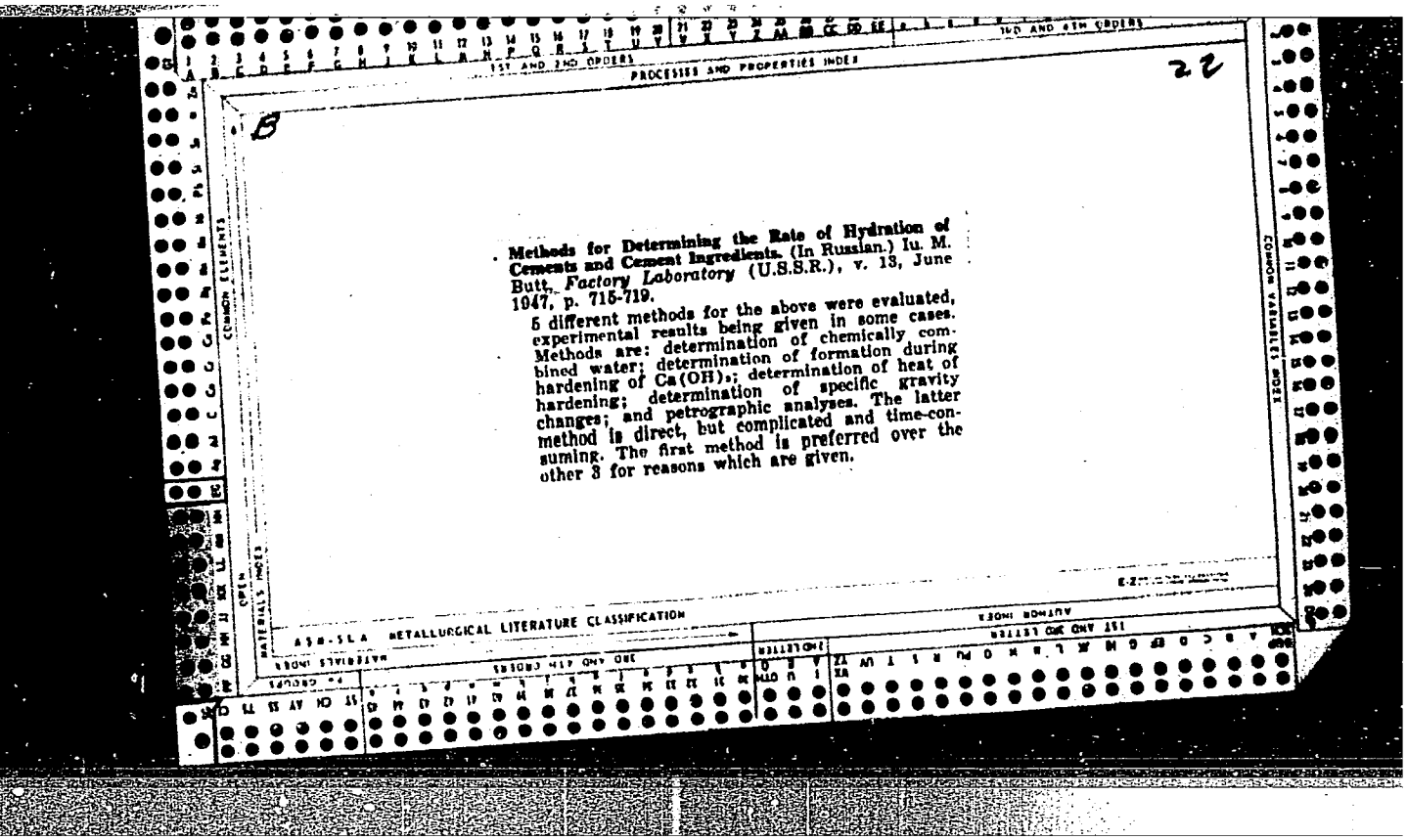
In many places where the raw material for cement is mined, materials known as marls are also mined along with it. Usually, this latter substance is separated and thrown off to maintain the quality of the cement. These marls are composed of lime and calcium carbonates, however, which can both be used in the production of portland cement. The authors describe a method whereby marls can be utilized for cement production. Experiments were conducted at the "Giant" Cement Factory.

PA 29T19



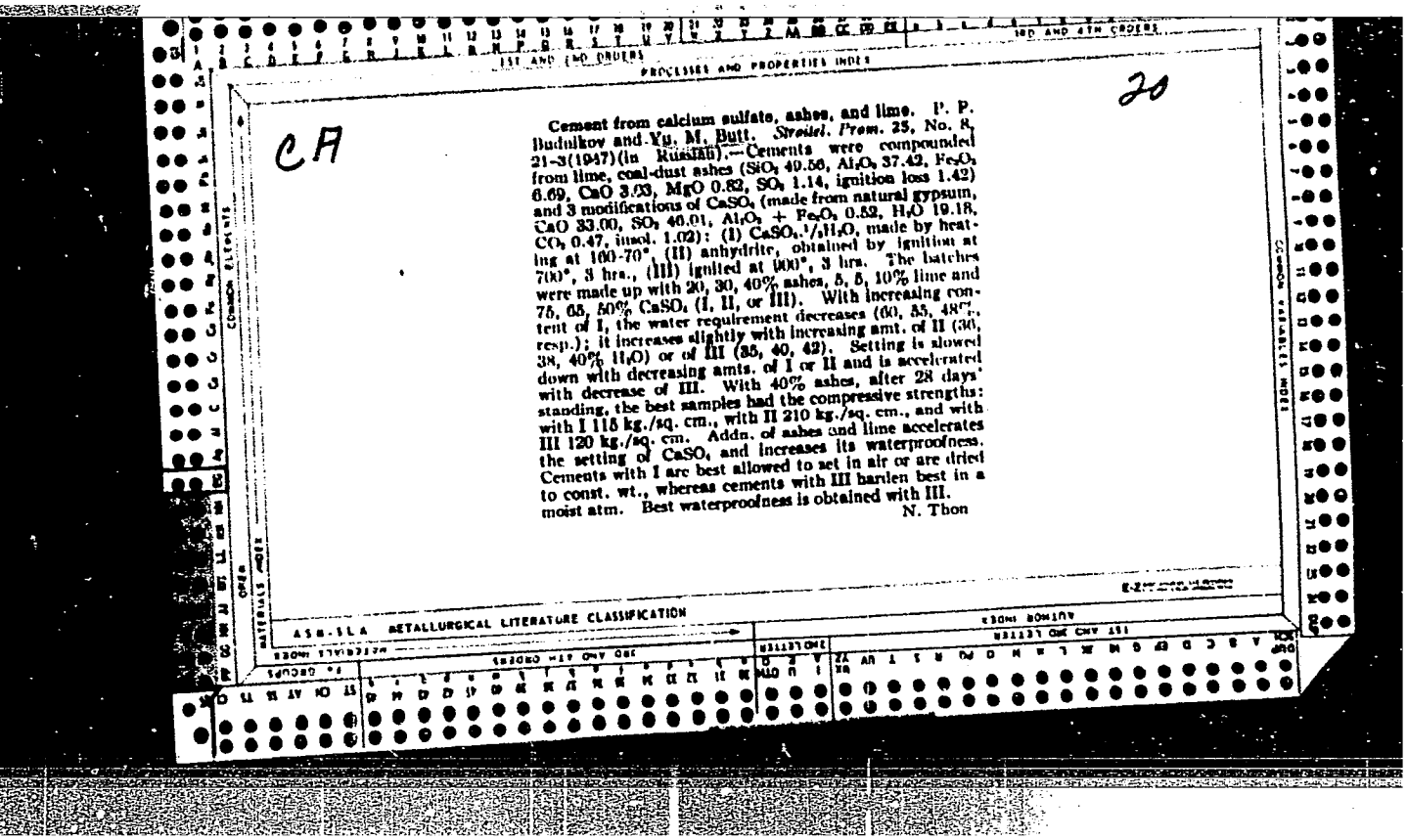
712. ASH CEMENTS. Budnikov, P.P. and Butt, Y. M. (Tsement, 1947, vol. 13, (7), 9-11; abstr. in Chem. Abstr., 1949, vol. 43, 1938). Ash from power station boilers in combination with other substances was tested for its suitability as a bonding material. For these tests the ash was mixed with anhydrite or with anhydrite and lime. In addition was also tested a mixture of cement and anhydrite. The mixtures of anhydrite and ash were weaker than anhydrite alone. The addition of up to 10% of lime and keeping the ash content at not over 10% improved the resistance of the mixture.

C.A.



Methods for Determining the Rate of Hydration of Cements and Cement Ingredients. (In Russian.) Iu. M. Butt, *Factory Laboratory* (U.S.S.R.), v. 13, June 1947, p. 715-719.

5 different methods for the above were evaluated, experimental results being given in some cases. Methods are: determination of chemically combined water; determination of formation during hardening of $Ca(OH)_2$; determination of heat of hardening; determination of specific gravity changes; and petrographic analyses. The latter method is direct, but complicated and time-consuming. The first method is preferred over the other 3 for reasons which are given.



CA

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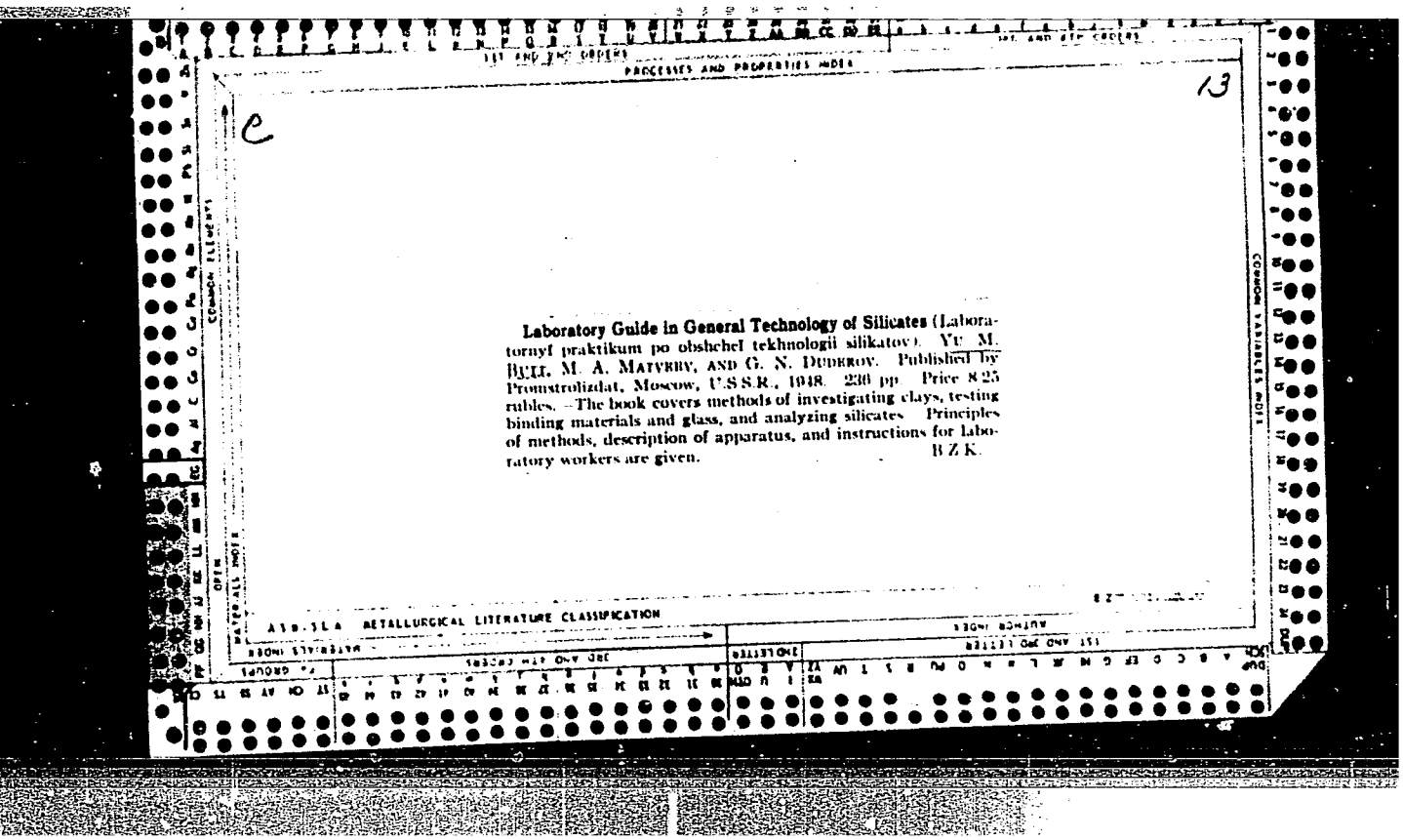
Cement from calcium sulfate, ashes, and lime. P. P. Budnikov and Yu. M. Butt. *Stroitel. Prom.* 25, No. 8, 21–3(1947)(in Russian).—Cements were compounded from lime, coal-dust ashes (SiO_2 49.56, Al_2O_3 37.42, Fe_2O_3 6.69, CaO 3.03, MgO 0.82, SO_3 1.14, ignition loss 1.42) and 3 modifications of $CaSO_4$ (made from natural gypsum, CaO 33.00, SO_3 46.01, Al_2O_3 + Fe_2O_3 0.52, H_2O 19.18, CO_2 0.47, insol. 1.02): (I) $CaSO_4.{}^1/_2H_2O$, made by heating at 160–70° (II) anhydrite, obtained by ignition at 700°, 3 hrs., (III) ignited at 900°, 3 hrs. The batches were made up with 20, 30, 40% ashes, 5, 5, 10% lime and 75, 65, 50% $CaSO_4$ (I, II, or III). With increasing content of I, the water requirement decreases (60, 55, 48%, resp.); it increases slightly with increasing amt. of II (30, 38, 40% H_2O) or of III (35, 40, 42). Setting is slowed down with decreasing amts. of I or II and is accelerated with decrease of III. With 40% ashes, after 28 days' standing, the best samples had the compressive strengths: with I 115 kg./sq. cm., with II 210 kg./sq. cm., and with III 120 kg./sq. cm. Addn. of ashes and lime accelerates the setting of $CaSO_4$ and increases its waterproofness. Cements with I are best allowed to set in air or are dried to const. wt., whereas cements with III harden best in a moist atm. Best waterproofness is obtained with III.

N. Thon



PROCESSES AND PROPERTIES INDEX

13

C

Laboratory Guide in General Technology of Silicates (Laboratornyf praktikum po obshchel tekhnologii silikatov). Yu. M. BUTT, M. A. MATVEEV, AND G. N. DUDEROV. Published by Promstrolizdat, Moscow, U.S.S.R., 1948. 230 pp. Price 8.25 rubles. —The book covers methods of investigating clays, testing binding materials and glass, and analyzing silicates. Principles of methods, description of apparatus, and instructions for laboratory workers are given.

B Z K

A S T M METALLURGICAL LITERATURE CLASSIFICATION

BUTT, YU. M.

27782. FAL'KOV, I. A., BUTT, YU. M. i IVAKHNO, N. V. — Vyazhushchiy material iz ochazhnykh ostatkov kol'tsevykh pechey. Mest. Stroit. Materialy, 1948 Vyp. 9, S. 21-26.

SO: Letopis' Zhurnal'nykh Statey, Vol. 37, 1949.

BUTT, YU. M.

USSR/Chemistry - Cement
Chemistry - Calcium Sulfate

Jan 1948

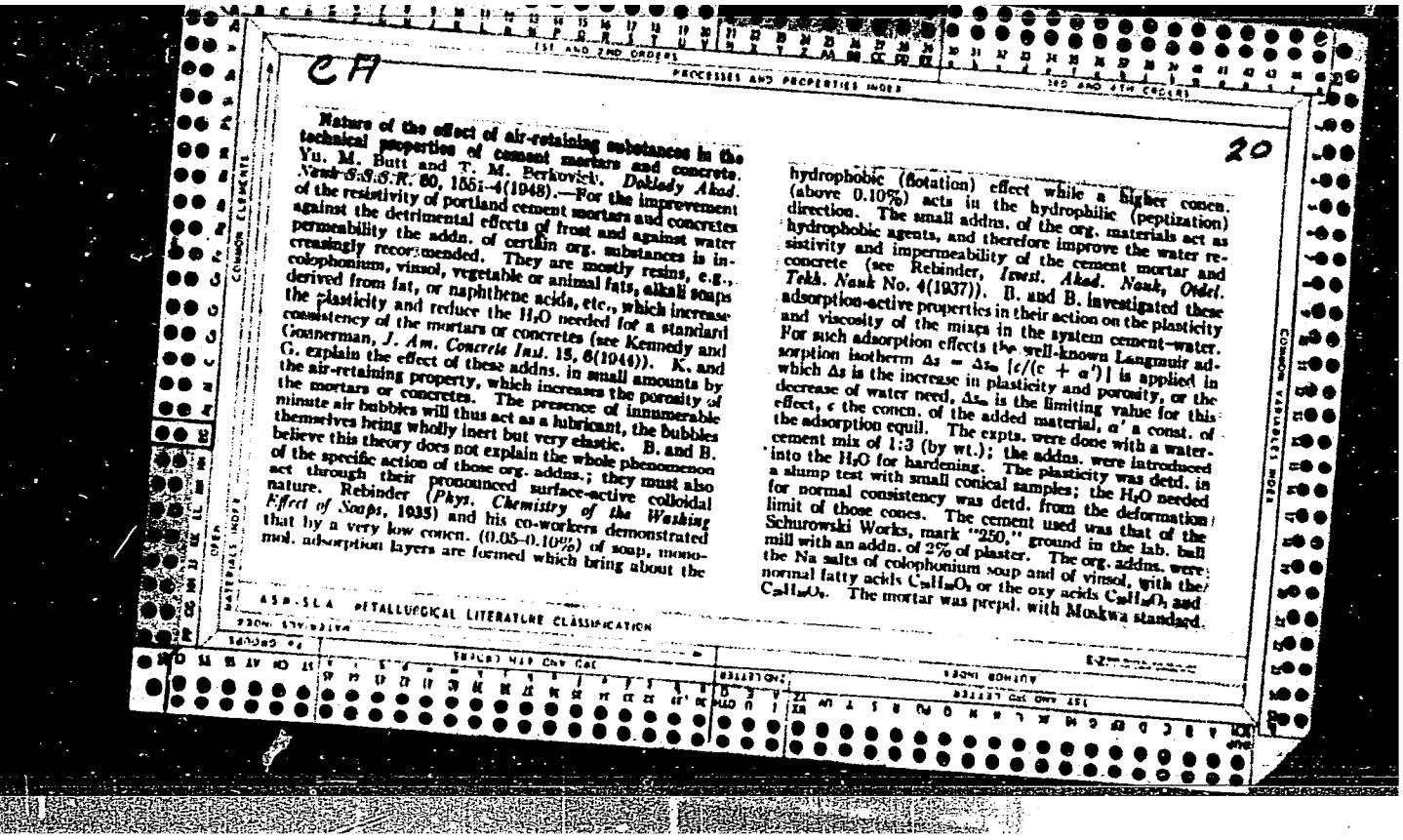
"Effect of TeTs-Cement on the Binding Properties of Various Modifications of Calcium Sulfate," P. P. Budnikov, Yu. M. Butt, 7 pp

"Zhur Prik Khim" Vol XXI, No 1

Subject cement speeds up hydration of calcium sulfate and increases its hardness and water resistance. Hardening of semihydrous cements goes on best in air media, and takes approximately 7 days. Humid climate cause setting to take place in about 28 days. Cements containing gypsum set faster than ordinary cements.

Submitted 28 Mar 1947

PA 64T1



CH

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Nature of the effect of air-retaining substances in the technical properties of cement mortars and concrete. Yu. M. Butt and T. M. Berkovich. *Doklady Akad. Nauk S.S.S.R.* 60, 1551–4(1948).—For the improvement of the resistivity of portland cement mortars and concretes against the detrimental effects of frost and against water permeability the addns. of certain org. substances is increasingly recommended. They are mostly resins, e.g., colophonium, vinsol, vegetable or animal fats, alkali soaps derived from fat, or naphthene acids, etc., which increase the plasticity and reduce the H_2O needed for a standard consistency of the mortars or concretes (see Kennedy and Gonnerman, *J. Am. Concrete Inst.* 15, 6(1944)). K. and G. explain the effect of these addns. in small amounts by the air-retaining property, which increases the porosity of the mortars or concretes. The presence of innumerable minute air bubbles will thus act as a lubricant, the bubbles themselves being wholly inert but very elastic. B. and B. believe this theory does not explain the whole phenomenon of the specific action of those org. addns.; they must also act through their pronounced surface-active colloidal nature. Rebinder (*Phys. Chemistry of the Washing Effect of Soaps*, 1935) and his co-workers demonstrated that by a very low concn. (0.05–0.10%) of soap, monomol. adsorption layers are formed which bring about the hydrophobic (flotation) effect while a higher concn. (above 0.10%) acts in the hydrophilic (peptization) direction. The small addns. of the org. materials act as hydrophobic agents, and therefore improve the water resistivity and impermeability of the cement mortar and concrete (see Rebinder, *Izvest. Akad. Nauk, Otdel. Tekh. Nauk* No. 4(1937)). B. and B. investigated these adsorption-active properties in their action on the plasticity and viscosity of the mixes in the system cement–water. For such adsorption effects the well-known Langmuir adsorption isotherm $\Delta s = \Delta s_\infty [c/(c + a')]$ is applied in which Δs is the increase in plasticity and porosity, or the decrease of water need, Δs_∞ is the limiting value for this effect, c the concn. of the added material, a' a const. of the adsorption equil. The expts. were done with a water-cement mix of 1:3 (by wt.); the addns. were introduced into the H_2O for hardening. The plasticity was detd. in a slump test with small conical samples; the H_2O needed for normal consistency was detd. from the deformation limit of those cones. The cement used was that of the Schurowski Works, mark "250," ground in the lab. ball mill with an addn. of 2% of plaster. The org. addns. were the Na salts of colophonium soap and of vinsol, with the normal fatty acids $C_{18}H_{36}O_2$ or the oxy acids $C_{18}H_{36}O_3$ and $C_{18}H_{36}O_4$. The mortar was prepd. with Moskwa standard.

sand with a grain size modulus 2.1. The H_2O was that of the city supply. The results were plotted in diagrams with Δs as ordinate, c as abscissa. Linear equations of the type $c/\Delta s = (a'/\Delta s_m) + (1/\Delta s_m)c$ were obtained from which Δs_m was given as cotan β of the slope (β the angle with the abscissa axis), a is the segment on the ordinate axis, from which a' is given as $a\ (\Delta s_m)$ in Langmuir's adsorption isotherm, from which the curves for the plasticity, water need, and air content (porosity) were derived. The agreement of the calcd. with the exptl. results is very satisfactory. Certain deviations are explained for the Na soap of colophonium through its very easy and sudden changes in dispersity and thereby of its surface-active effects in a change of concn. W. Eitel

BUTT, Yu. M.

26411 Tvorcheskaya deyatelnost' professora vladimira nikolayevmcha yunga. (Spetsialist v oblastm silikathykh stroit. Materialov. K 65-letiyu so dnya rozhdeniya). Svornik nauch. Rabot po vyazhushchim materialam m. 1949, s. 5-11.

SO: LETOPIS' NO. 35, 1949

BUTT, Yu. M.

26410 Issledovaniye alitovogo tsementa. Svornik nauch. Rabot po vyazhushchim materialam. m, 1949, s. 72-82. Bibliogr: 5 nazv.

SO: LETOPIS' NO. 35, 1949

BUTT, Yu. M.

Yung, V. N. and Butt, Yu. M. - "The effect of gypsum on the properties of water cement," Trudy Mosk. khim.-tekhnol. in-ta im. Mendeleyeva, Issue 15, 1949, p. 19-35

SO: U-5240, 17, Dec. 53, (Letppis 'Zhurnal 'nykh Statey, No. 25, 1949).

BUTT, Yu. M.

Butt, Yu. M. - Investigation of the binding properties of the system 4 CaO, Al_2O_3, Fe_2O_3, — $2CaO$, SiO_2," Trudy Mosk. khim.-tekhnol. in-ta im. Mendeleyeva, Issue 15, 1949, p. 63-74, - Bibliog: 6 items

SO: U-5240, 17, Dec. 53, (Letopis 'Zhurnal 'nykh Statey, No. 25, 1949).

BUTT, Yu. M.

Butt, Yu. M. - "The hydrothermal treatment of congealing cement and its component compounds," Trudy Mosk. khim.-tekhnol. in-ta im. Mendeleyeva, Issue 15, 1949, p. 94-105

SO: U-5240, 17, Dec. 53, (Letopis 'Zhurnal 'nykh Statey, No. 25, 1949).

BUTT, YU. M.

35337. Vliyanie Usloviy Zatvoreniya Na Protsess Tverdeniya Portlandtsementa. Trudy Mosk. Khim.-Tekhnol. In-Ta Im. Mendeleeva, Vyp. 16, 1949, S. 11-20

SO: Letopis'Zhurnal nykh Statey,Vol. 34, Moskva, 1949

BUTT, YU. M.

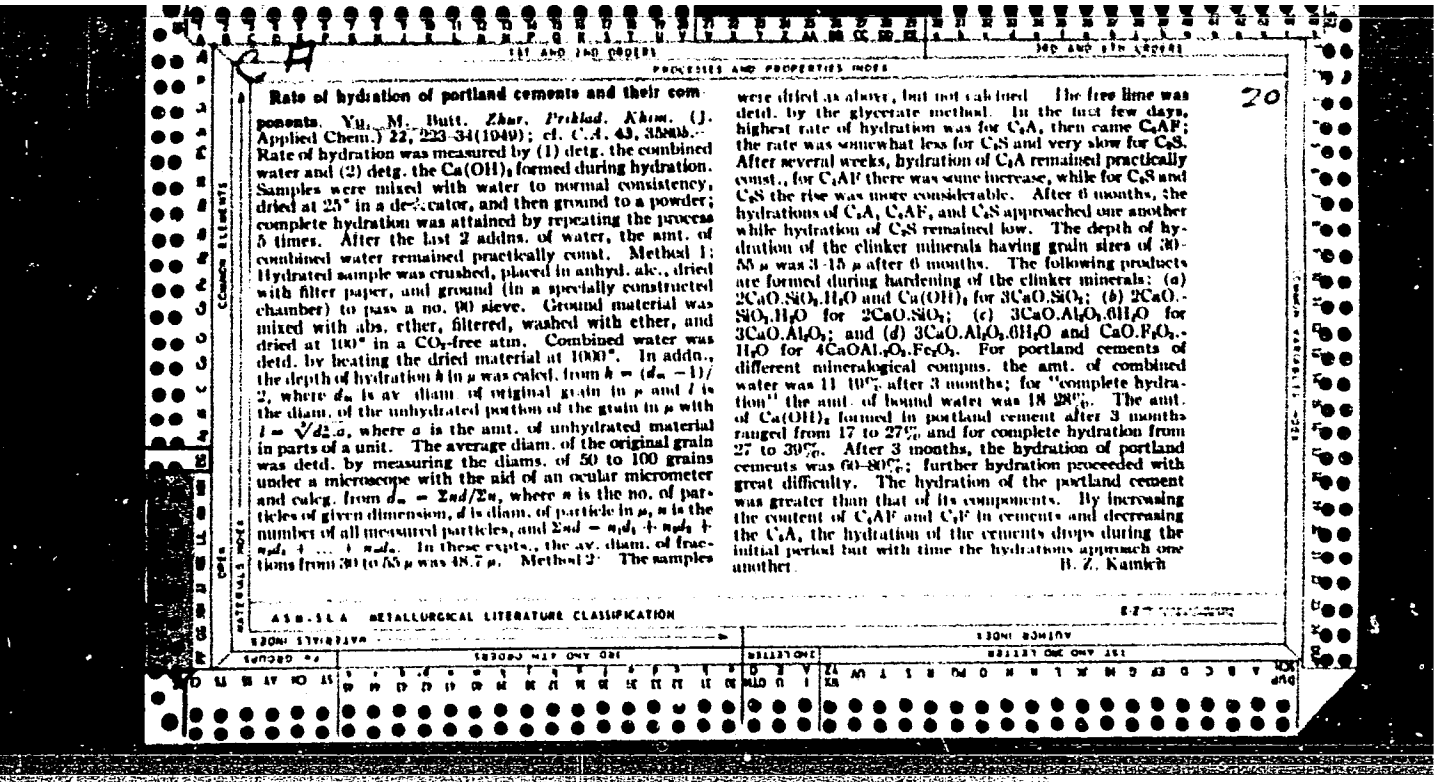
35336. BUTT, YU. M. Vliyanie gipsana portlandtsementy razlichnogo mineralogicheskogo sostava, Trudy Mosk. Khim.-Tekhnow. In-Ta Im. mendeleeva. Vyp. 16, 1949, S. 30-42

SO: Letopis' Zhurnal'nykh Statey Vol. 34, Moskva 1949

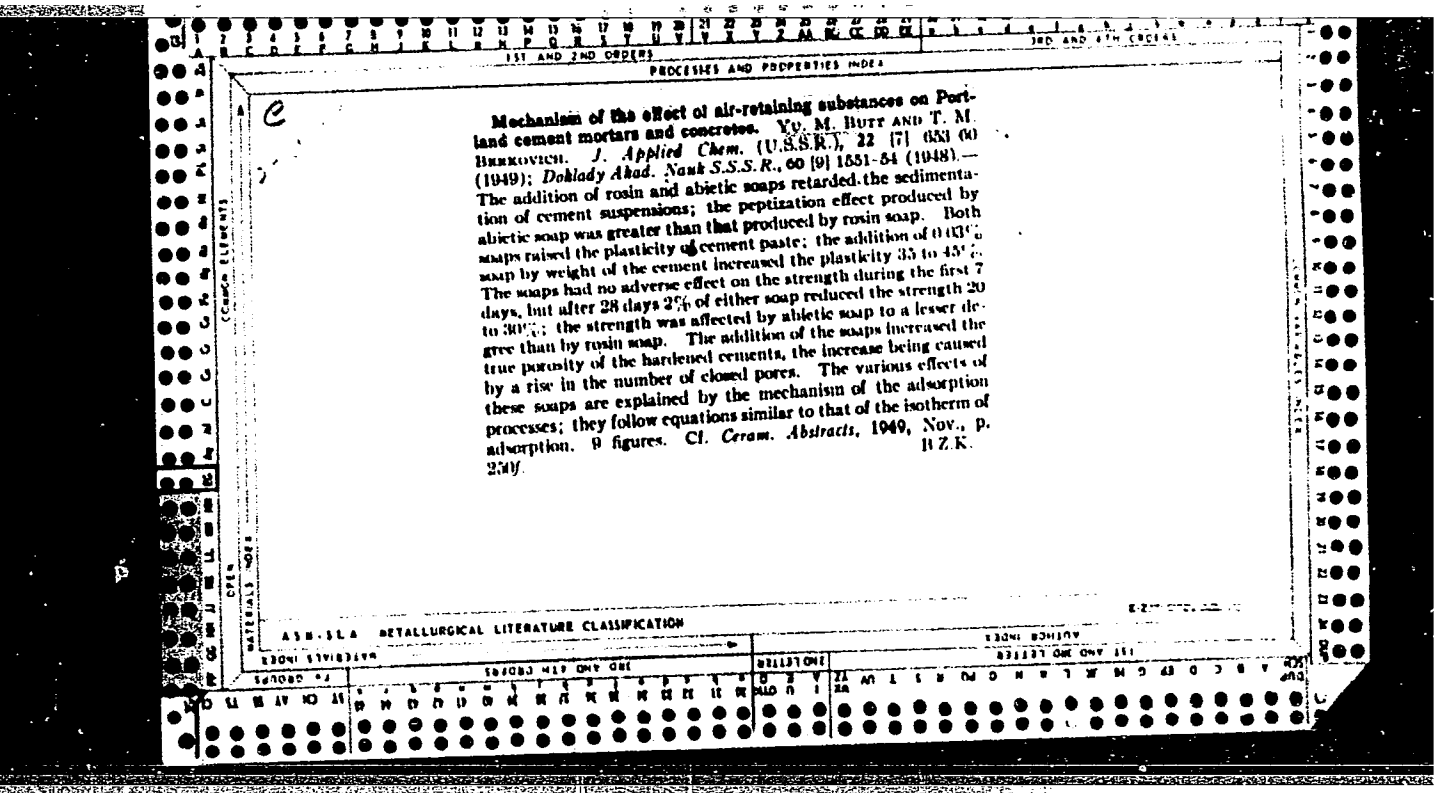
BUTT, YU. M.

3532 6. Issledovanie Vyazhushchikh Svoystv Sistemy 3cao. al_2O_3-2aO.SO2. Trudy Mosk: Khim:-Tekhnol. In-Ta Im. Mendeleeva, Vyp. 16, 1949, S. 53-58

SO: Letopis'Zhurnal'Statey, Vol. 34, Moskva, 1949



Rate of hydration of portland cements and their components. Yu. M. Butt. *Zhur. Prikład. Khim.* (J. Applied Chem.) **22**, 223–34(1949); cf. *C.A.* **43**, 3580b.—Rate of hydration was measured by (1) detg. the combined water and (2) detg. the $Ca(OH)_2$ formed during hydration. Samples were mixed with water to normal consistency, dried at 25° in a desiccator, and then ground to a powder; complete hydration was attained by repeating the process 5 times. After the last 2 additns. of water, the amt. of combined water remained practically const. Method 1: Hydrated sample was crushed, placed in anhyd. alc., dried with filter paper, and ground (in a specially constructed chamber) to pass a no. 90 sieve. Ground material was mixed with abs. ether, filtered, washed with ether, and dried at 100° in a CO_2-free atm. Combined water was detd. by heating the dried material at 1000°. In addn., the depth of hydration h in μ was calcd. from $h = (d_m - l)/2$, where d_m is av. diam. of original grain in μ and l is the diam. of the unhydrated portion of the grain in μ with $l = \sqrt[3]{d^3 - a}$, where a is the amt. of unhydrated material in parts of a unit. The average diam. of the original grain was detd. by measuring the diams. of 50 to 100 grains under a microscope with the aid of an ocular micrometer and calcg. from $d_m = \Sigma nd/\Sigma n$, where n is the no. of particles of given dimension, d is diam. of particle in μ, n is the number of all measured particles, and $\Sigma nd = n_1d_1 + n_2d_2 + n_3d_3 + \ldots + n_nd_n$. In these expts., the av. diam. of fractions from 30 to 55 μ was 48.7 μ. Method 2: The samples were dried as above, but not calcined. The free lime was detd. by the glycerate method. In the first few days, highest rate of hydration was for C_3A, then came C_4AF; the rate was somewhat less for C_3S and very slow for C_2S. After several weeks, hydration of C_3A remained practically const., for C_4AF there was some increase, while for C_3S and C_2S the rise was more considerable. After 6 months, the hydrations of C_3A, C_4AF, and C_3S approached one another while hydration of C_2S remained low. The depth of hydration of the clinker minerals having grain sizes of 30–55 μ was 3–15 μ after 6 months. The following products are formed during hardening of the clinker minerals: (*a*) $2CaO.SiO_2.H_2O$ and $Ca(OH)_2$ for $3CaO.SiO_2$; (*b*) $2CaO.SiO_2.H_2O$ for $2CaO.SiO_2$; (*c*) $3CaO.Al_2O_3.6H_2O$ for $3CaO.Al_2O_3$; and (*d*) $3CaO.Al_2O_3.6H_2O$ and $CaO.F_2O_3.H_2O$ for $4CaOAl_2O_3.Fe_2O_3$. For portland cements of different mineralogical compns. the amt. of combined water was 11–16% after 3 months; for "complete hydration" the amt. of bound water was 18–28%. The amt. of $Ca(OH)_2$ formed in portland cement after 3 months ranged from 17 to 27% and for complete hydration from 27 to 39%. After 3 months, the hydration of portland cements was 60–80%; further hydration proceeded with great difficulty. The hydration of the portland cement was greater than that of its components. By increasing the content of C_4AF and C_2F in cements and decreasing the C_3A, the hydration of the cements drops during the initial period but with time the hydrations approach one another. B. Z. Kamich



PROCESSES AND PROPERTIES INDEX

Mechanism of the effect of air-retaining substances on Portland cement mortars and concretes. Yu. M. Butt and T. M. Berkovich. *J. Applied Chem.* (U.S.S.R.), 22 [7] 653 (60) (1949); *Doklady Akad. Nauk S.S.S.R.*, 60 [9] 1551–54 (1948).—The addition of rosin and abietic soaps retarded the sedimentation of cement suspensions; the peptization effect produced by abietic soap was greater than that produced by rosin soap. Both soaps raised the plasticity of cement paste; the addition of 0.03% soap by weight of the cement increased the plasticity 35 to 45%. The soaps had no adverse effect on the strength during the first 7 days, but after 28 days 2% of either soap reduced the strength 20 to 30%; the strength was affected by abietic soap to a lesser degree than by rosin soap. The addition of the soaps increased the true porosity of the hardened cements, the increase being caused by a rise in the number of closed pores. The various effects of these soaps are explained by the mechanism of the adsorption processes; they follow equations similar to that of the isotherm of adsorption. 9 figures. Cf. *Ceram. Abstracts*, 1949, Nov., p. 317K. 230f.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

BUTT, Yu. M.

11 - (3) - 43

Rosin and abietic resin as plasticizers for Portland cement. Yu. M. Butt and T. M. Berkovich. *Doklady Akad. Nauk S.S.S.R.*, 66 [3] 443–46 (1949).—Ordinary, alite, belite, and celite Portland cements were ground to a specific surface of 3100 to 3200 cm.²/gm., mixed with 0.1% of rosin and abietic resin and 3% $CaSO_4 \cdot 0.5H_2O$ by weight of cement, and tested in plastic solutions (1:3). Abietic resin increased the strength of alite and ordinary cements, caused no increase in strength of belite cements, and considerably reduced the strength of cements containing much celite. Rosin had no harmful effect on the strength of alite and ordinary cements, lowered the strength of belite cements, and caused a considerable drop in the strength of cement having much celite. Rosin produced a substantial plasticizing effect in all the cements, but abietic resin affected only the alite and ordinary cements. The effects of rosin and abietic resin on the plasticity and strength of the cements varied with the grain composition of the cements; the plasticizing effect was greater, the more intensive the adsorption of the admixtures on the clinker grains, but this, in turn, lowered the rate of hydration of the clinker with a resulting drop in the strength of the hardened cement. Thus, rosin, which had a good plasticizing effect on all the cements, formed relatively dense adsorption films which had no harmful effect on the strength only in the case of sufficiently active cements with a normal or increased alite content; abietic resin, which had a relatively weaker plasticizing effect on belite cements, formed "liquid" adsorption films which could have no harmful effect on the hydration of the cements. Rosin and abietic resin in the unsaponified state may be used for increasing the plasticity and life of cements and concretes without reducing the strength; the use of abietic resin for this purpose will not lower the strength of other cements except those with a high celite content. B.Z.K.

BUTT, YU. M.

(The general technology of silicates) Moskva, Gos. izd-vo lit-ry po stroit. materialam, 1950. 591 p. (52-25482)

TP807.B94

CA

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Effect of alkalies on the properties of calcium silicates. V. N. Yung, Yu. M. Butt, and V. V. Myshlyaeva. *Tsement* 17, No. 6, 9–13(1951).—K_2O in various quantities but always in excess was added to synthesized alite or belite with or without CaF_2 and the mixt. was calcined at 1480–1500°. The temp. was raised 250–300° per hr. and kept at the max. for 2.5–3 hrs. K_2O reacted with Ca silicate to form $23CaO.K_2O.12SiO_2$ and free CaO. Addn. of SiO_2 (sand) and recalcination caused the free lime to combine with it, forming C_8KS_{12} and C_2S. Evidently C_8KS_{12} formed readily at 1500° while C_2S was harder to form. Of the K_2O added and in the presence of 0.5% CaF_2 45–85% volatilized; in the absence of CaF_2 34–85% volatilized. The presence of K_2O retarded the setting of compns. based on C_2S and accelerated the C_2S compns. Addn. of 3% gypsum hastened the setting; C_8KS_{12} set faster than C_2S and C_2S. Addn. of K_2O lowered the strength of C_2S but its effect on C_2S was not evident. K_2O lowered the water resistance. Addn. of 3% gypsum to a product contg. K_2O improved the strength and water resistance. $23CaO.K_2O.SiO_2$ synthesized from $CaCO_3$, ground sand, and K_2O had a very low water resistance; the latter was somewhat improved by 3% of gypsum.

M. Hosch

CA

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Effect of organic additions on the physicochemical properties of cement stone. Yu. M. Butt and T. M. Berkovich. *Doklady Akad. Nauk S.S.S.R.* 77, 453-5(1951).—Effect of abietic resin and Na abietic and rosin soaps on the microstructure of cement stone was investigated by the method of H_2S diffusion. Plastic molded 2 × 2 × 2-cm. cubes made of portland cement (1:3) were stored for 28 days under standard conditions and then in a chamber in which H_2S concn. ranged from 0.6 to 4.5% by vol. Extent of diffusion was measured by appearance of fresh fracture. Most samples showed coloration. The adsorption of org. additns. on the grains of the cement (monominerals) and their selective action on the hydration of the various components of the portland-cement clinker affect the physicochem. structure of the cement stone. B. Z. Kamich

1952

Butt, Yu.M.

YUNG, V.N., doktor tekhnicheskikh nauk, professor, redaktor; BUTT, Yu.M.; ZHURAVLEV, V.F.[deceased]; OKOROKOV, S.D.; BERKOVICH, T.M., kandidat tekhnicheskikh nauk, retsenzent; KRZHEMINSKIY, S.A., inzhener, retsenzent; SHPAYER, A.L., redaktor; PANOVA, L.Ya., tekhnicheskiy redaktor

[Technology of adhesives] Tekhnologiia viazhushchikh veshchestv. Moskva, Gos. izd-vo lit-ry po stroit. materialam, 1952. 600 p. [Microfilm]
(Cement) (MLRA 7:10)

1. BUTT, Yu.M. PROF.

2. USSR (600)

4. Gypsum

7. Increasing the water-resistance and durability of building gypsum. Buil. stroi. tekh. 9 no. 22, 1952

9. Monthly List of Russian Accessions, Library of Congress, February 1953. Unclassified.

BUTT, YU. M.

Praktikum po tekhnologii viazhushchikh veshchestv i izdelii iz nikh /Practical work on the technology of binding materials and articles made from them/. 2-e izd. Moskva, Promstroiizdat, 1953. 467 p.

SO: Monthly List of Russian Accessions, Vol. 7, No. 3, June 1954.

BUTT, Yu.M.

PHASE I TREASURE ISLAND BIBLIOGRAPHICAL REPORT AID 502 - I

Call No.: TA435.B77

BOOK

Authors: BUTT, YU. M. and BERKOVICH, T. M.
Full Title: BINDING AGENTS WITH SURFACE ACTIVE INGREDIENTS
Transliterated Title: Vyazhushchiye veshchestva s poverkhnostno-aktivnymi dobavkami

PUBLISHING DATA

Originating Agency: None
Publishing House: State Publishing House of Literature on Building Materials
Date: 1953 No. pp.: 448 No. of copies: 4,000
Editorial Staff: None

PURPOSE: This monograph is intended for scientific researchers, engineers and technicians working in the field of construction materials.

TEXT DATA

Coverage: This monograph deals with binding agents used as building solutions and added to concrete mixtures; their production, properties, advantages and applications are described. Various organic admixtures are considered, particularly their influence on the properties of cements depending on their mineralogical composition, conditions in which they set, fineness of their grinding, the content of gypsum and other factors. The admixtures under consideration are of two cate-

gories: water-admitting, e.g., sulphate cellulose liquor and water-repellent, e.g., naphthanate soap, acidol containing naphthanate soap, etc. The influence of organic surface active ingrediences on the properties of binding materials is explained according to present physicochemical concepts concerning dispersion systems and surface phenomena.

No. of References: Russian 144 (1928-1952)

Facilities: A number of institutions and laboratories where research work on cement is conducted are listed in the preface, also names of many scientific researchers, among them P. A. Rebinder, who rote the first chapter of the book.

BUTT, Yu. M.

Controlling the hydration rate of lime. Yu. M. Butt and Z. S. Krasnoslobodskaya. *Sbornik Trudov Resp. Nauch.-Issledovatel. Inst. Mestnykh Stroitel. Materialov* 1953, No. 5, 117-24; *Referat. Zhur., Khim.* 1954, No. 50401.—Addn. of gypsum, Na_2SO_4, Na silicate, slops from alcoholic black liquor fermentation, and naphtha soap retarded hydration, while $CaCl_2$ and NaCl promoted slaking of ground limestone.

M. Hoch

BUTT, Yu.M.

Jour. of the Amer. Ceramic Soc.
Vol. 37 No. 3
March 1954
Cements, Limes, and Plasters

Technology of Binding Materials (Tekhnologiya vyazhushchikh veshchestv). V. N. YUNG, YU. M. BUTT, V. F. ZHURAVLEV, AND S. D. OROKOV. State Publishing House of Structural Materials, Moscow, 1952, 600 pp., illus. Price R15.50. Reviewed in *Tsement*, 19 [2] 32 (1953).—A collection of papers by members of Moscow and Leningrad universities give the latest accomplishments in the technology of building materials in the U.S.S.R.
B.Z.K.

BUTT, Yu. M.

Chemical Abst.
Vol. 48 No. 8
Apr. 25, 1954
Cement, Concrete, and Other
Building Materials

Petrographic investigation of corrosion processes of cement. Yu. M. Butt and K. G. Krut. *Tsement* 19, No. 6, 16–21(1953).—Effects of artificial sea water or 1% $MgSO_4$ on clinker minerals with and without admixts. of basic and acid siliceous slags were investigated by petrographic analysis. In sea water, the destruction of portland cement stone is, in all probability, due first to the formation of $Mg(OH)_2$ and then to $CaSO_4.2H_2O$ and Ca hydrosulfoaluminate, if there is still some unreacted $3CaO.Al_2O_3$ from the reaction: $3CaO.Al_2O_3 + 3MgSO_4 + nH_2O = 3CaSO_4 + 2Al(OH)_3 + 3Mg(OH)_2$. Only then is it possible for C_3A to link with gypsum and for Ca hydrosulfoaluminate to form. It is also possible to have addnl. mech. destruction due to the formation and growth of NaCl crystals. In 1% $MgSO_4$, the destruction of the cement stone is apparently caused primarily by the formation of Ca hydrosulfoaluminate and partly by $Mg(OH)_2$ or $CaSO_4.2H_2O$. Upon addn. of acid or basic slag, Ca hydrosulfoaluminate was not observed in sea water or in 1% $MgSO_4$, except when a hydrated mixt. of C_4AF and basic slag was treated with 1% $MgSO_4$. Upon addn. of basic slag, $CaSO_4.2H_2O$ forms and, in some cases, when sea water is added, NaCl crystals appear. $CaSO_4.2H_2O$ does not always form when acid slag is added; in some cases, there were no new formations in connection with corrosion, but an accumulation of introduced aggressive salts in the form of $MgSO_4$.

B. Z. Kamieh

Butt, Yu. M.

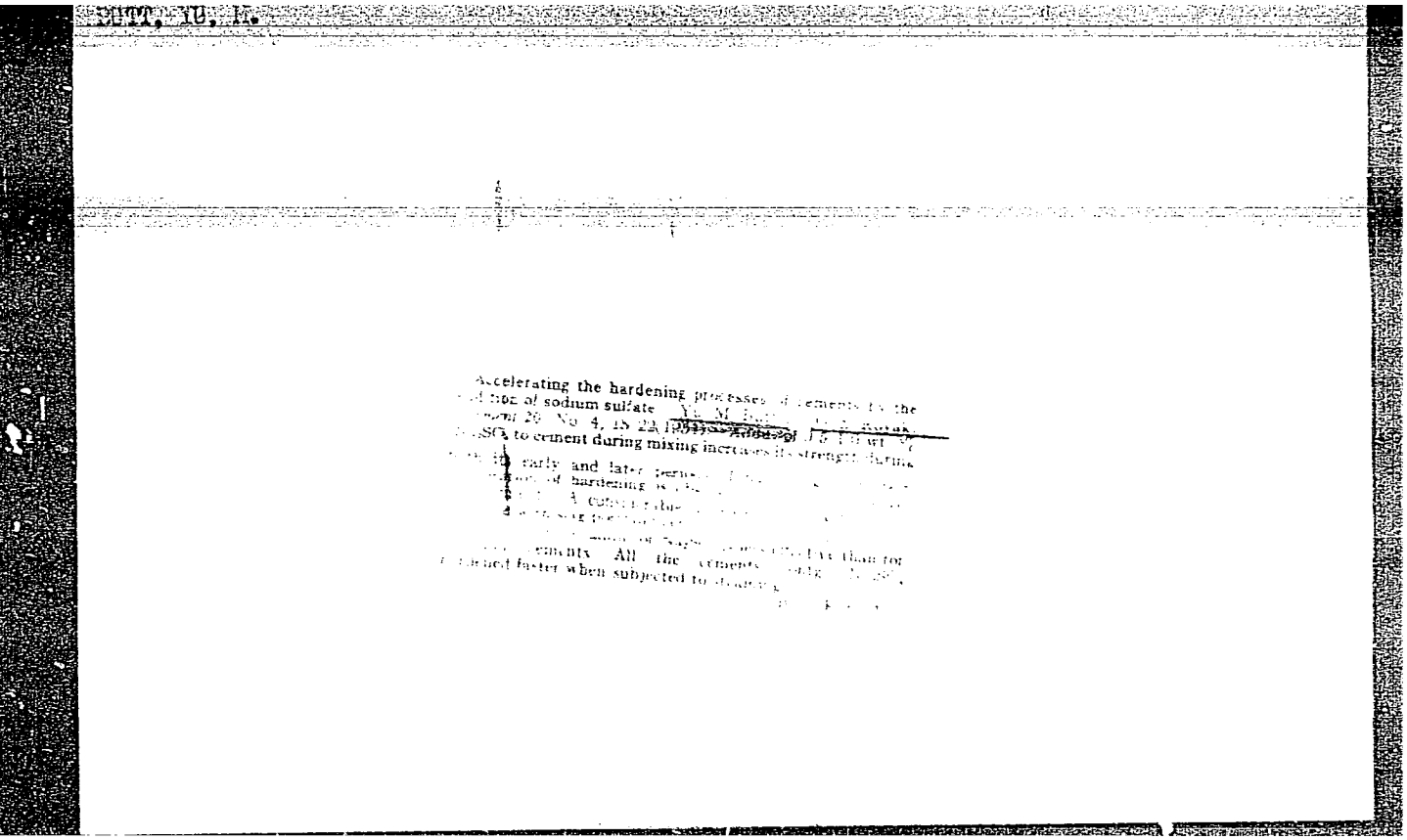
Formation of calcium hydrosilicates and hydroaluminates by hydrothermal treatment. Yu. M. Butt and S. A. Krzhe-
62 minskii. *Doklady Akad. Nauk S.S.S.R.* 89, 709-12 (1953).—Systematically varied mixes of $Ca(OH)_2$ with SiO_2 (quartz, sand, and SiO_2 gel), α-Al_2O_3, and Al_2O_3 hydrogel, were autoclaved at 173–174° (8 atm. satd. steam pressure) during 8 and 48 hrs. Mech. strengths, $CaO:SiO_2$ and $CaO:Al_2O_3$ ratios, and H_2O contents of the products were detd. The SiO_2 hydrogel required more $Ca(OH)_2$ for max. strength, and higher H_2O content than cryst SiO_2. The amts. of cryst. products in the mixes of $Ca(OH)_2$ with cryst. SiO_2 were larger than with the hydrogel, but Al_2O_3 hydrogel bound more free $Ca(OH)_2$ than cryst. α-Al_2O_3. Mixes of $CaO:SiO_2$, 1:1 and 1:2, contained the hydrate $CaO.SiO_2 \cdot H_2O$ in the cryst. products; in mixes $CaO:SiO_2$ (2:1) a $3CaO.2SiO_2$ hydrate appeared. The less basic mixes of $Ca(OH)_2 + Al_2O_3$ produced a hydrate of $2CaO.Al_2O_3$, the more basic mixes the stable $3CaO.Al_2O_3.6H_2O$, and mixes 4:1 the aluminate hydrate $4CaO.Al_2O_3$. (5 to 6) H_2O. Another exptl. series was made of the same mixes at 202° to 203° (16 atm. satd. H_2O steam) for 16 hrs. The products showed generally a lower mech. strength than those at 173°, and contained monohydrates of $CaO.SiO_2$ and $3CaO.SiO_2$. Under the same hydrothermal conditions the mixes of $Ca(OH)_2 + Al_2O_3$ gave $2CaO.Al_2O_3$ and $4CaO.Al_2O_3$ hydrates (with 5 to 6 mols. H_2O). Steam curing of $Ca(OH)_2$, SiO_2, and Al_2O_3 at 80° to 95° in the open system for 48 hrs. brought about only low mech. strengths of the products because of a sluggish reaction of the ingredients. The effects were studied of accelerators [NaCl (1%), $CaCl_2$ (2%), water glass (3%), and $AlCl_3$ (3%)], at 8 atm. for 8 hrs. NaCl and water glass promoted the reactions and brought about increased mech. strengths for mixes of $Ca(OH)_2 + SiO_2$ compared with the corresponding mixes treated in the autoclave with pure H_2O. For $CaO:SiO_2 = 1:2$ the products were examd. by differential-thermal analysis; the samples without any addn. showed only a slight endothermic effect at 500° (dehydration of $Ca(OH)_2$); the sample with 1% NaCl added, however, showed a distinct effect at 200° (dehydration of the Ca silicate hydrate), and no effect at 500°. Evidently, all available $Ca(OH)_2$ is bound to SiO_2. At 760–5° the NaCl-accelerated product shows a strong exothermic effect, while the sample treated with pure H_2O showed one at 1000°.

W. Eitel

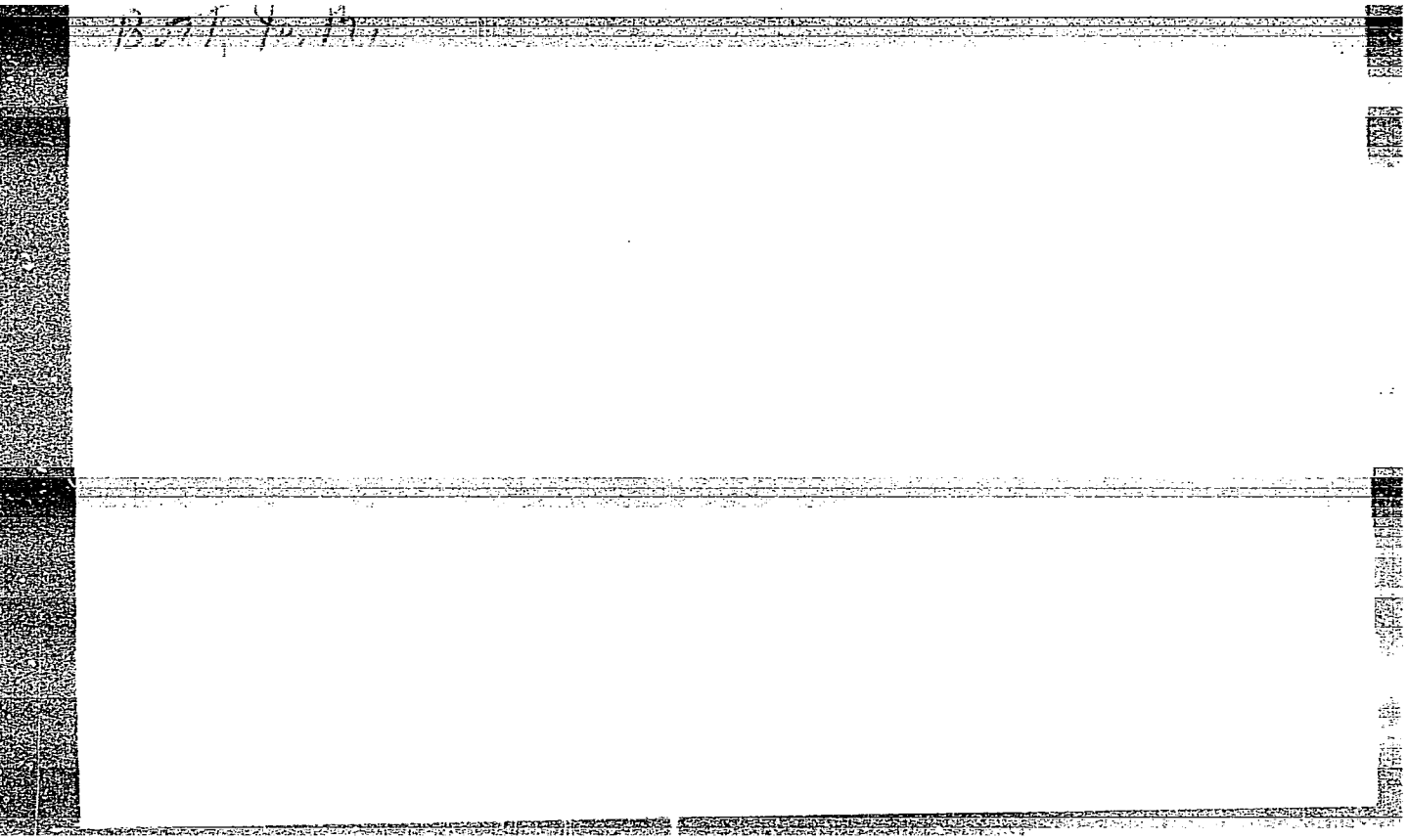
(1)

BUTT, Yu. M.

Interaction between calcium hydroxide and crystalline silica at ordinary temperatures. Yu. M. Butt. *Sbornik Trudov Respublik. Nauch.-Issledovatel. Inst. Mestnykh Stroitel. Materialov* 1954, No. 6, 115–22; *Referat. Zhur., Khim.* 1955, No. 4209.—Upon the interaction of cryst. quartz and lime at ordinary temps. the lime is absorbed by the powd. quartz thus forming a Ca hydrosilicate. This process proceeds at a definite rate on the surface of sand grains when lime-sand mixes harden under ordinary conditions. Along with it proceed processes of carbonization and crystn. of $Ca(OH)_2$. The interaction of lime and quartz are of importance in the hardening of lime-sand mixts. as well as of lime-clay mixts. if these materials contain free lime. M. Hosch



Accelerating the hardening processes of cements by the
addition of sodium sulfate
SO3 to cement during mixing increases the strength during
early and later periods
of hardening
cements. All the cements
exhibit faster when subjected to



APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307810003-9"

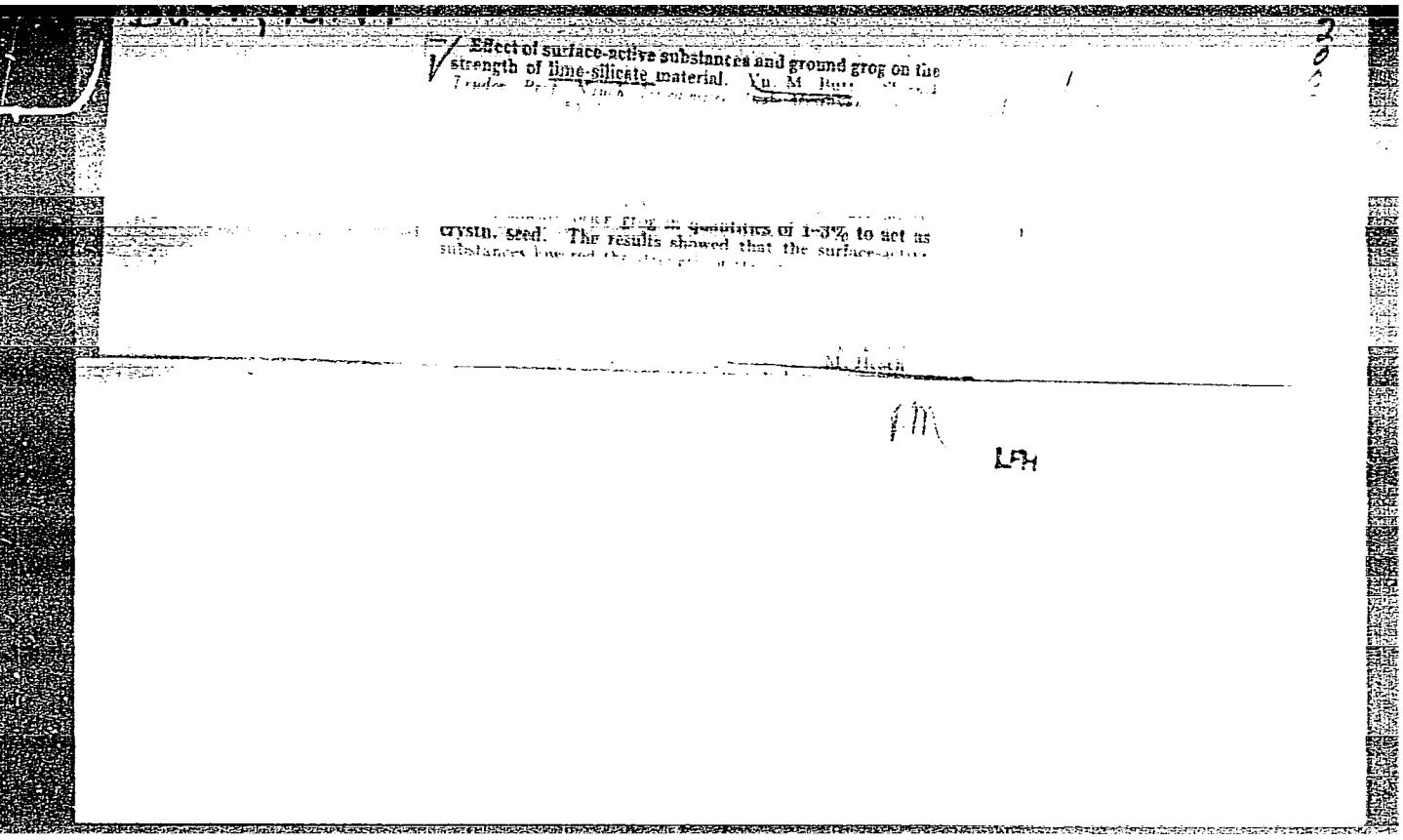
1. YU M. BUTT, PROF., T. M. BERKOVICH

2. USSR (600)

4. Cement

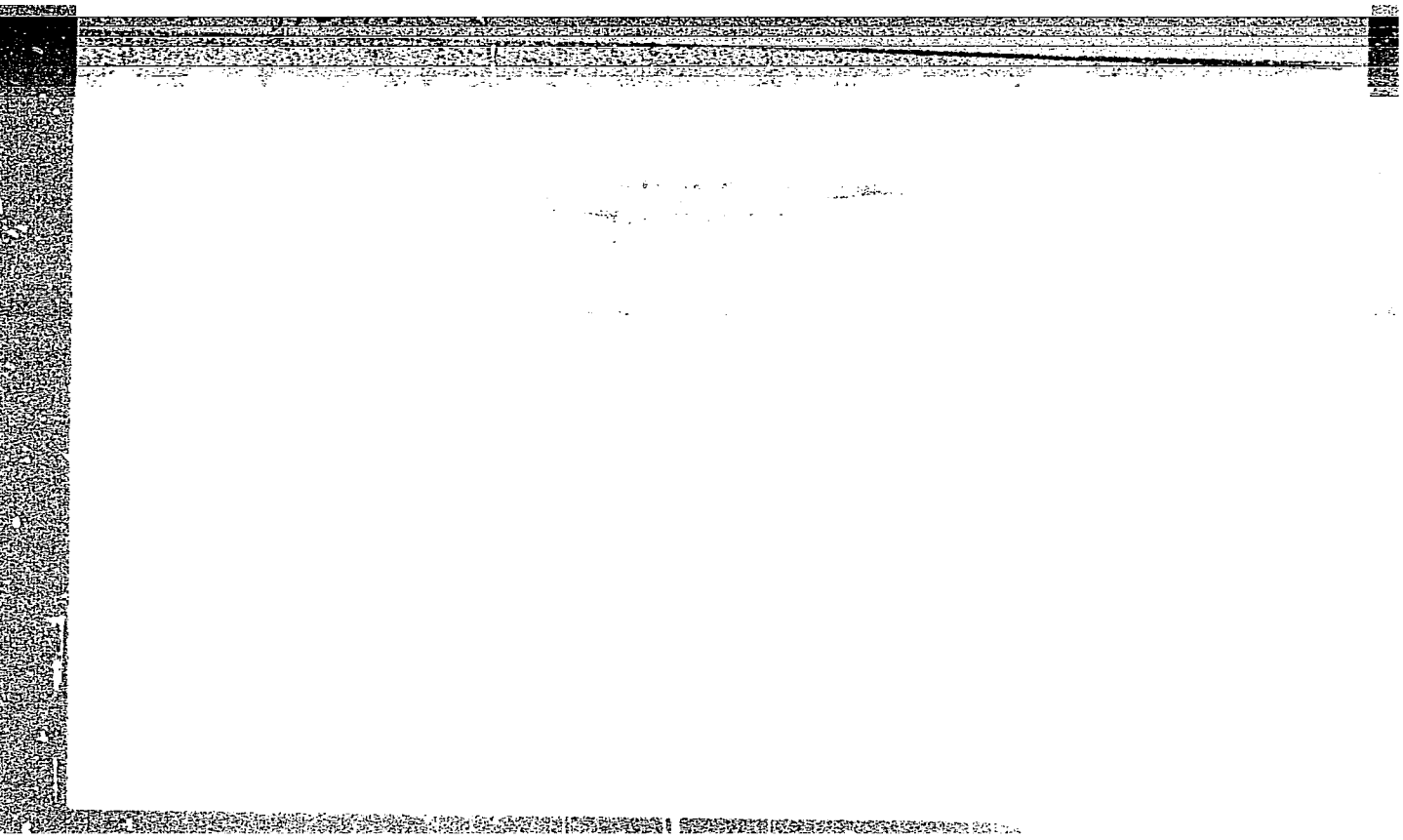
7. Effect of surface-acting substances on the properties of cements with admixtures. TSement 18 no. 6. 1953.

9. Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.



Effect of surface-active substances and ground grog on the strength of lime-silicate material. Yu. M. [illegible]

[illegible] crystn. seed. The results showed that the surface-active substances [illegible]



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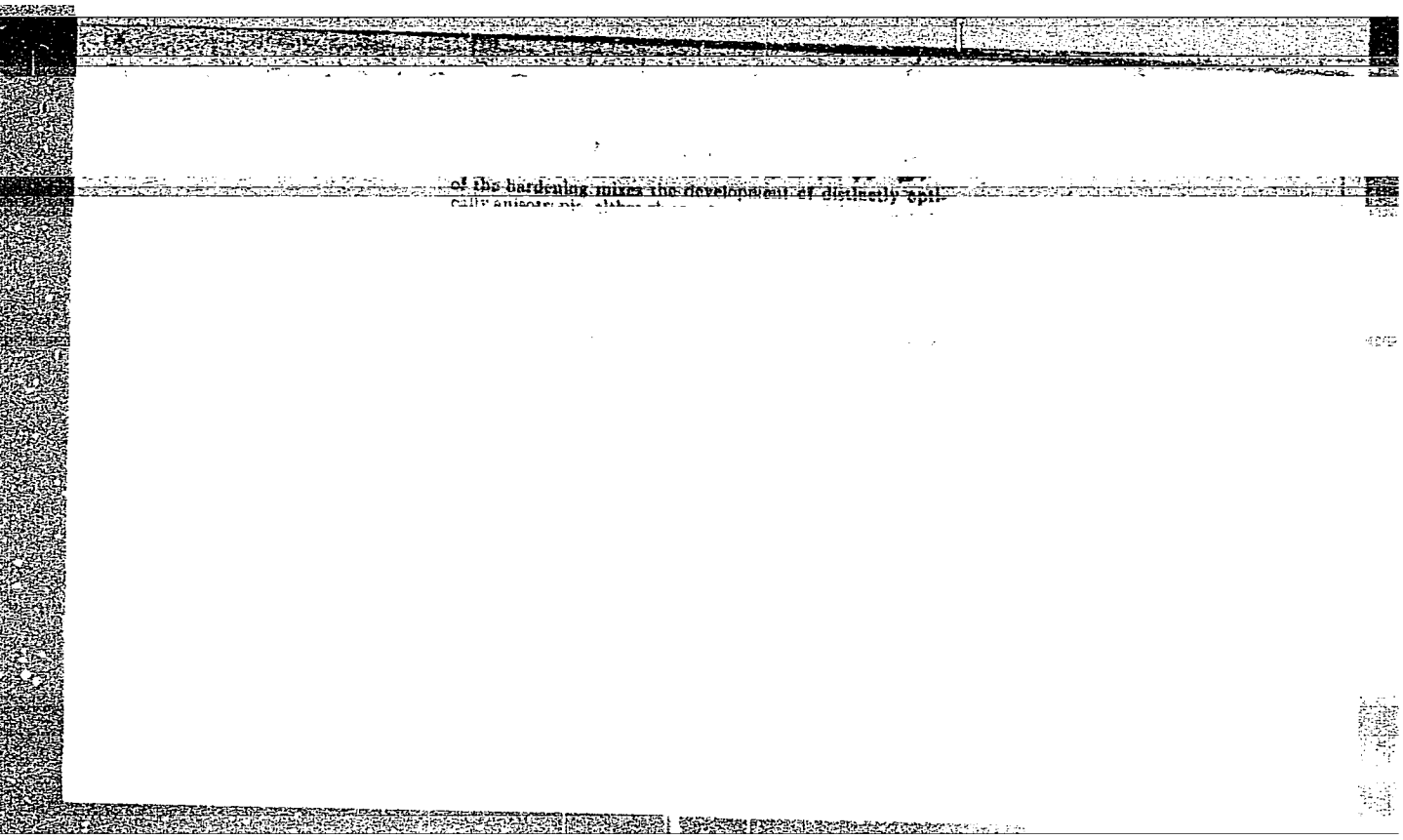

BUTT, YU.M.

BUDNIKOV, P.P.

"Binding substances with surface-active additions." IU.M.Butt, T.M.Berkovich. Reviewed by P.P.Budnikov. Zhur.prikl.khim. 27 no.6:689-690 Je '54. (MLRA 7:8)
(Surface-active agents) (Butt, IU.M.) (Berkovich, T.M.)
(Binders (Chemistry))

Butt, Yu.M.

BUDNIKOV, P.

"Technology of binding materials." V.N.IUng, IU.M.Butt, V.F.Zhuravlev, S.D.Okorokov. Reviewed by P.Budnikov. Zhur.prikl.khim. no.27 no.6:691-692 Je '54. (MLRA 7:8)
(Binders(Chemistry)) (IUng, Vladimir Nikolaevich, 1882-) (Butt, IU.M.) (Zhuravlev, V.F.) (Okorokov, S.D.)

SOKOLOV, Pavel Nikolayevich; BUTT,Yu.M., professor, doktor tekhnicheskikh nauk, redaktor; TYUTYUNIK,M.S., redaktor; LYUDKOVSKAYA,H.I., tekhnicheskiy redaktor

[Technology of asbestos-cement articles] Tekhnologiia asbesto-tsementnykh izdelii. Izd. 2-e, dop. i ispr. Moskva, Gos. izd-vo lit-ry po stroit. materialam, 1955. 259 p. (MLRA 9:3)
(Asbestos cement)

Butt, Yu. M.

4101* Study of the Erosion of Cements for Hydraulic-Engineering Concretes. **Issledovanie istiraniia tsementov dlia gidrotekhnicheskikh betonov.** (Russian.) V. N. Iung, Iu. M. Butt, M. S. Neginskii, and E. O. Barbakadze. *Tsement*, v. 21, no. 6, Nov.-Dec. 1955, p. 5-9.

Effect of fast-flowing water. Compositions, erosibility, and compressive strength of cements. Effect of additives on erosibility. Tables.

Butt, Yu. M.

AID P - 2791

Subject : USSR/Chemistry

Card 1/1 Pub. 152 - 19/19

Authors : Butt, Yu. M., L. M. Khavkin, S. A. Krzheminskiy, and S. N. Levin

Title : Hint, I. "O nekotorykh osnovykh voprosakh avtoklavnogo izgotovleniya izvestkovo-peschanykh izdeliy". Some fundamental problems of manufacturing sand-lime materials in autoclaves, Tallin, 1954. (Book Review)

Periodical : Zhur. prikl. khim. 28, 4, 449-452, 1955

Abstract : Critical review

Institution : None

Submitted : No date

BUTT, Yu. M.

AID P - 3506

Subject : USSR/Chemistry

Card 1/1 Pub. 152 - 21/21

Author : Butt, Yu. M.

Title : Conclusions reached at the conference on the chemistry of cements

Periodical : Zhur. prikl. khim., 28, 6, 668-672, 1955

Abstract : This is a review of papers presented at the conference held in Moscow on January 5, 1955. It was resolved to continue further study of the chemistry of cements and of methods to improve their quality as well as to develop new materials for the construction industry. No references.

Institution : None

Submitted : No date

BUTT,Yu.M., professor, doktor tekhnicheskikh nauk

Fast hardening cement for making precast reinforced concrete elements and products. Gor. khoz. Mosk. 29 no.7:21-23 Jl '55. (Precast concrete) (MLRA 8:9)

BUTT, Yuriy Mikhaylovich; TYUTYUNIK, M.S., redaktor; GLADKIKH, N.N. tekhnicheskiy redaktor

[Technology of cement and other binding materials] Tekhnologiia tsementa i drugikh viazhushchikh materialov. Izd. 3-e, perer. Moskva, Gos. izd-vo lit-ry po stroit. materialam, 1956. 347 p. (Cement) (MLRA 10:4)

BUTT, Yu. M.

Distr: 4E2c

Proceedings of the symposium on the chemistry of cement. Trudy Soveshchaniya Khim. Tsementa ... Sci. ... of Industry of Bldg. Materials 1956 M. ... Budnikov, Yu. M. Butt, S. ... [illegible] ... Physicochemical processes of ... clinker formation. V. N. Yung. 14-19. A survey. Composition and crystallization conditions of celite in portland cement clinker. N. A. Toropov and A. I. Bolkova. 20-? --The refractive indexes n_g and n_p for the modifications α and α' of 5CaO.3Al... and ... 4CaO.Al... are plotted in straight lines as functions of the compn. ... solid solns. The exptl. data of synthetic solid solns. ... this series correspond much better to the presence of the ... modification than to α-5CaO.3Al... The limit ... the structure of ... hypothetical 2CaO ... content ... with n_g = 1.914, n_p = ... are much less ... than is 4CaO.Al₂O₃.Fe₂O₃ ... of this limit phase is $8CaO.3Al_2O_3.Fe_2O_3$. The compn. ... heavy-grain fractions of portland cements isolated by centrifugation in CH_2I_2 always showed refractive indexes lower than that of $4CaO.Al_2O_3.Fe_2O_3$. An optical detn. of the true celite compn. in the aluminate-ferrite phase is indispensable for accurate calcns. Importance of the inner structure of alite crystals in portland cements for rapid ... hardening construction ... [illegible] ... of alite ... the higher the strength. In expts. to develop high-early-strength cements a Polish marl, high in

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P. P. Budnikov; Yu. A. [illegible]

Al_2O_3 was burned with limestone to form $CaO.Al_2O_3$, and $\beta \rightarrow \gamma$-$2CaO.SiO_2$. The finely powd. disintegration product was extd. to remove Al_2O_3 hydrate, the residual Ca_2SiO_4 was an excellent raw material for the desired alite cements. About 90% of the chem. energy of the alite can be made useful in the new type of early-high-strength portland cements. Because of their heat of hydration the concrete may attain temps. up to 65° as is desirable for winter concrete construction. Chemical methods for the examination of the phase composition of cement clinkers

S. M. Ivanyak, E. I. Nagerova, and G. G. Kormenko, 42-82. The glass-contg. matrix of portland-cement clinkers is selectively sol. in N AcOH; at room temp. in 75 min. under shaking $3CaO.Al_2O_3$ is completely dissolved, only about 10% of the $4CaO.Al_2O_3.Fe_2O_3$ and $5CaO.3Al_2O_3$ are dissolved, and $2CaO.SiO_2$ and $3CaO.SiO_2$ are decompd. completely. The sol. Ca silicates can be detd. separately by extn. with H_3BO_3 soln. In com. portland cements with alumina moduli between 0.86 and 2.71 the soly. of celite in AcOH is increased. The higher the $5CaO.3Al_2O_3$ content in the solid solns. of the series $2CaO.Fe_2O_3$–$5CaO.3Al_2O_3$, the higher the soly. The soly. of quenched samples is generally higher than that of slowly cooled samples. H_3BO_3 does not leach CaO from the silicates dissolved in the quenched glasses. The mol. ratio $CaO:(Al_2O_3 + Fe_2O_3)$ in the portion insol. in AcOH is practically const. (= 2) independently of the cooling rates. The resistance of clinkers to sulfate-contg. water depends on the amts. of noncrystd. aluminate-ferrite and $3CaO.Al_2O_3$, detd. by the AcOH test. In Al_2O_3-enriched blast-furnace-slag cements the observed gehlenite and $5CaO.3Al_2O_3$ contents are as a rule higher than those calcd. from the normal compn., and the $CaO.Al_2O_3$

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and [illegible] SiO$_2$ contents lower [illegible] slag. [illegible] a high mech.
strength show a ratio Al_2O_3 CaO above [illegible] with genuine
above 30, and even 40%. The process of clinkering in the
rotary kiln. O. M. Astreeva. 53-62. The progress of
chem. reactions in the granules of portland-cement mixes
in the different thermal zones of the rotary kiln is affected
by the furnace shape and construction. CaO formed by
dissocn. of the limestone is first bound as $2CaO.SiO_2$, by a
typical solid-state reaction. Particularly characteristic
are the $2CaO.SiO_2$ crystals surrounding residual quartz
grains, and around pores in the clinker structure. Alite
in small amounts also is a product of such reactions at rela-
tively low temps.; its recrystn. is chiefly detd. by the pres-
ence of liquid phases. Compn. of the aluminate-ferrites
in the clinker depends on the burning conditions and on the
cooling rates. A slowly cooled clinker is lower in $3CaO.$-
Al_2O_3, because more aluminate is dissolved in the aluminate-
ferrite solid solns. The cooling conditions are also impor-
tant for the structure and compn. of the alite and belite.
Especially in CaF_2-contg. mixes, the alite crystals in slowly
cooled clinkers show distinct disintegration to free CaO and
$2CaO.SiO_2$. Crystal chemistry of hydraulic materials.
O. P. Mchedlov-Petrosyan. 63-77; cf. C.A. 49, 12808h.
[illegible] The chemical process of hydration of serpentinitic
cement is not a simple rehydration of the anhyd. serpen-
tine; the differential-thermal curves of the hydration prod-
ucts are totally different from those [illegible]
[illegible] magnetic field of 25 [illegible]
[illegible] effect on the OH$^-$ groups [illegible] a strong
[illegible] strength of the product than that of the normally
hydrated serpentinitic cement samples. The refractive
index of the [illegible] hydration products surrounding th

P.P. Budnikov, Yu. M. Butt...

...important results is [illegible]
...is derived a generalized theory of hydration hardening ...
...in materials that by different thermal treatment ...
...undergone a change in the original condition ...
...of active cations. On these distorted active centers are ...
...adsorbed the OH ions from the solns. bringing about ...
...breakdown of the cement particles ...
The role of mineralizers in the formation of cement clinker
A. A. Toropov, S. L. Golynko-Vol'fson, and M. M. Sychev
78–82.—BaF_2 is more active in the formation of $2CaO.SiO_2$ ...
(in the temp. range 1000° to 1100°), and of $3CaO.SiO_2$, than
are CaF_2, MgF_2, AlF_3, NaF. The mineralizing action of the
fluorides is attributed to interaction between HF in the
kiln atm. with SiO_2 of the raw mix to form a highly loosened
structure that more readily undergoes solid-state reactions
with CaO. Fluosilicates also are mineralizing agents,
the addn. of 1.5 to 1.7% of $CaSiF_6$ and $MgSiF_6$ is optimum.
By-products of the superphosphate industry are very suit-
able in place of the pure salts. The formation of a rather
fluid liquid phase is observed as low as 500° to 600° in the
systems NaF–$CaCO_3$ and NaF–CaO. Study of $3CaO.SiO_2$
and $3CaO.Al_2O_3$ in the field of high temperature. [illegible]
Volkovskii. 83–92.—A high-temp. x-ray diffraction camera
was constructed with a Pt-Rh furnace (used up to 1500°)
for the study of polymorphism in clinker constituents.
The disintegration of pure $3CaO.SiO_2$ at 1175° was dis-
tinctly observed after 50 hrs. If 5% gypsum was added,
the same disintegration occurred after 24 hrs. At 1375°,
pure $3CaO.SiO_2$ undergoes a polymorphic inversion forming
α–$3CaO.SiO_2$ with the characteristic interplanar distances
2.94, 2.78, 2.32, 2.00, and 1.47 A. Mixes of $3CaO.Al_2O_3$ +
5% KF or NaF show a strong disintegration to $5CaO.3Al_2O_3$

P. P. Budnikov, Yu. M. [illegible], Sovetskaya [illegible]

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and free CaO at 800°, but above 1300° (for KF) and 1400° (for NaF) no more reaction of this kind is observed, and the $3CaO.Al_2O_3$ diagram reappears, evidently after a complete volatilization of the fluorides. CaF_2 reacts in the same way, decomposing $3CaO.Al_2O_3$ at 1000°, but at 1400°, $3CaO.Al_2O_3$ reappears. No polymorphic phenomena are observed in $3CaO.Al_2O_3$, only the common thermal expansion effects. Investigation on reaction accelerators in solid mixes. P. P. Budnikov and A. M. Gusatins. [illegible]. Mineralizers are defined as substances that accelerate characteristic reactions in the solid state. The distinction of accelerators from catalysts is based on the theories of heterogeneous catalysis (cf. Roginskii, *C. A.* 42, 2501). The question of how much may be the critical amount of accelerator is answered in general from hypotheses on the mechanism of the reaction. The sensitivity of heating curves is details [illegible] sufficient to detect thermal effects of this kind. Application of a rapid ionization x-ray analysis for the investigation of cements. [illegible] is described, characterized by a photographic registration on sensitive paper from a galvanometer with amplifier. This instrument is combined with a high-temp. furnace. The decomp. of limestone and kaolin, the inversions of quartz and Al_2O_3 ($\gamma \rightarrow \alpha$ at 1050° to 1100°), and the new formation of mullite, corundum, etc., were studied. Theoretical aspects of hydraulic minerals based on the periodic system of Mendeleev and the knowledge of metastable [illegible] higher complex [illegible] signals [illegible] stabilities. Hydraulic properties are shown only by those compds. which Fersman

[illegible] "unstable" (metastable), with distorted (defect) cryst. structures. Often pure compds. do not show hydraulic properties, but contaminations (foreign cations) activate the structure. In the same manner, dehydration, [illegible] and quenching to glass [illegible] [illegible] hydraulic character [illegible] [illegible] pH a colloidal suspension is formed [illegible] [illegible] segregate and [illegible] [illegible] theory describes the hydraulic character of all the hydraulic silicate and aluminate cements, of the phosphate (dental) pastes, Mchedlov-Petrosyan's "serpentinic cements," etc. Physical chemical ideas on the mechanism of setting and hardening of hydraulic mineral material [illegible] 125 [illegible] The initial surface of dry [illegible] is increased after 30 to 40 min. of H_2O action and then slowly decreased by a recrystn. of hydrates. The kinetics of the hydration of $3CaO.Al_2O_3$, $3CaO.SiO_2$, and $2CaO.SiO_2$, studied by the tracer method, shows the rapid hydration of $3CaO.Al_2O_3$, and the particularly slow hydration of $2CaO.SiO_2$. Also the heat evolution as a function of time gives characteristic kinetic curves for commercial cements with 9% and 5% $3CaO.Al_2O_3$ in their clinker compn. for the systems with pure H_2O, and for H_2O + 0.25% and 0.5% additions of a plasticizer from sulfite waste liquor. The high surface development in montmorillonite-like layer structures of the hydrophilic hydrates of Ca aluminates and aluminate-sulfate is most important in the setting with its first mech. strength effects. The corresponding reactions with the less active silicates det. the hardening process. The application of these aspects in practice is to find the optimum ratio between the rapid setting, and the slow hardening reactions for which the addition of org. substances

P. F. Ro[illegible]ov, Y. [illegible]

is most important. Investigation of the process of structure development in cement suspensions and the action of hydrophilic plasticizer from sulfite waste liquor on these processes. E. E. Segalova and [illegible]. cf. C. A. 4[illegible]. The first two to three [illegible] actions in a portland cement-H_2O paste chiefly the [illegible] of $3CaO.Al_2O_3$ dets. the initial mechanism [illegible] strengths in the stirred mix. Three stages in the colloid-phys. reactions which become particularly evident if plasticizing agents (e.g. from a sulfite waste liquor) are added, are (I) coagulation of the newly formed hydration products with included cement particles; this is a very short-time process; (II) development of a crystal structure in the hydration products, the system becomes thixotropic, i.e. sensitive to mech. stirring; (III) development of a rigid coagulation structure of hydrated aluminates after destroying the thixotropic paste of stage II, in which subsequently cement particles are suspended. Sulfite waste liquor stabilizes the products of type I; a considerable reduction of the requirement of H_2O in the paste is an immediate practically important consequence. The structure of the paste becomes relatively denser. In II the plasticizer facilitates the adsorption and dispersion of the hydrated compds. For this reason, the structure in III shows a strong increase again in H_2O requirement. For an optimum application of plasticizer with cements of variable contents in $3CaO.Al_2O_3$ the development of I of the paste is fundamental. For cements high in $3CaO.Al_2O_3$ the decrease in the ratio H_2O:cement is a max. In order to prolong I in the slurry, more hydrophilic plasticizer is needed. In gypsum-contg. cements the mechanism in I is similar to that in cements without gypsum, but sulfate aluminate is pptd. in place of the aluminate hydrates.

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15-57-5-6562

Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 5, p 123 (USSR)

AUTHORS: Yung, V. N., Butt, Yu. M.

TITLE: Local Bonding Structural Materials (Mestnyye vyazhushchiye stroitel'nyye materialy)

PERIODICAL: Sb. nauch. rabot po khimii i tekhnol. silikatov. Moscow, Promstroyizdat, 1956, pp 77-88.

ABSTRACT: Local bonding materials may include sandy clays, structural gypsum, limestone, chalk, dolomite, marl, sand, tripoli, diatomite, tuff, and various other deposits. Of all these bonding materials, gypseous material has the lowest kiln temperature. This temperature for structural gypsum ranges from 130° to 190°. Clay-gypsum is used for construction, especially in the southern regions of Armenia, Georgia, Azerbaidzhan, and Turkmenistan. This material is a gypseous marl with admixtures of finely dispersed silica and calcium carbonate. Structural clay-gypsum, when roasted at a

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Local Bonding Structural Materials (Cont.)

temperature of 160° to 250°, is very similar to ordinary structural gypsum. It is not so strong, but it is more water-resistant. Ash cements and other cements with a lime base (calcareous-slag, calcareous-puzzolan, calcareous-clay, etc.) may also be used. These are hydraulic cements of satisfactory strength. In addition, they are distinguished by slow hardening and inadequate resistance to air and frost. Cements consisting of 40 percent ash, ten percent lime, and 50 percent calcium sulfate have good properties. Local hydraulic bonding material may be produced from basalt by grinding it and mixing it intimately with slaked and unslaked lime and a small quantity of gypsum. Crystalline, partially crystalline, and glassy rocks are also shown to be suitable for the production of bonding material.

Card 2/2

S. P. Sh.

15-57-5-6578

Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 5, p 125 (USSR)

AUTHORS: Butt, Yu. M., Ayapov, U. A.

TITLE: Improvement in the Properties of Structural Gypsum by the Addition of Portland Cement and Sulfite-Alcohol Waste (Uluchsheniye svoystv stroitel'nogo gipsa pri dobavke portlandtsementa i sul'fitno-spirtovoy bardy)

PERIODICAL: Sb. nauch. rabot po khimii i tekhnol. silikatov. Moscow, Promstroyizdat, 1956, pp 167-177.

ABSTRACT: The introduction of 5 to 10 percent portland cement in structural gypsum increases its strength and moisture resistance. This procedure makes it possible to use gypsum products in climates with a relative humidity up to 85 percent. The introduction of portland cement in large proportions (20 to 40 percent of the weight of the gypsum and cement mixture), although it also increases the strength of structural gypsum hardening in air to an even greater extent, does not provide the

Improvement in the Properties of Structural Gypsum (Cont.)

necessary moisture resistance. The principal cause of destruction of the products made from a mixture of gypsum and portland cement while they are kept in water is the formation and growth of large quantities of calcium hydrosulfo-aluminate crystals in a mass that has already begun to harden. The introduction of portlend cement together with sulfite-alcohol waste in structural gypsum increases the quality of the product to a greater extent than the addition of portland cement alone.

Card 2/2

V. P. Ye.

Butt, Yu. M.

USSR /Chemical Technology. Chemical Products and Their Application I-12

Silicates. Glass. Ceramics. Binders.

Abs Jour: Referat Zhur - Khimiya, No 9, 1957, 31639

Author : Butt Yu. M.

Title : Control of Processes of Hardening of Binder Substances During Hydrothermal Treatment.

Orig Pub: Tr. Soveshchaniya po khimii tsementa. M., Promstroyizdat, 1956, 320-340.

Abstract: Binders of predetermined setting time and rapid hardening can be produced by changing their composition, degree of comminution, incorporating different additives, changing the conditions of hydrothermal treatment, and by a number of other

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Abs Jour: Referat Zhur - Khimiya, No 9, 1957, 31639

procedures. As a result thereof a change also takes place in the nature and structure of the new formations that are obtained in the hardened cementing substance. In particular $Ca(OH)_2$ that is formed on hydrolysis of C_3S is more active than the $Ca(OH)_2$ of slaked lime. In selecting the composition of cements for autoclave treatment (AT) it is necessary to take into account the fact that under ordinary conditions of AT it is the C_3S that exhibits the greatest strength. However, the relative acceleration of the process of hardening of C_2S is greater than that of C_3S. Sand is bound with lime which is liberated on hydrolysis

USSR /Chemical Technology. Chemical Products and Their Application I-12

Silicates. Glass. Ceramics. Binders.

Abs Jour: Referat Zhur - Khimiya, No 9, 1957, 31639

of C_3S, as well as on conversion of the hydrate of C_2S to less basic hydrosilicates. By changing the amount of ground sand and the conditions of AT it is possible to use cements containing any amounts of C_3S and C_2S, but in all instances with incorporation of the greatest possible amount of ground sand. A relatively high durability, on AT, is exhibited by C_4AF and a very low one by C_3A. Increase of the amount of gypsum produces no effect. In the production of lime-sand articles (LSA) the structure of which is subjected to plastic deformation during the first period after the shaping (cast articles, articles

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Abs Jour: Referat Zhur - Khimiya, No 9, 1957, 31639

subjected to vibratory treatment, etc.) it is advantageous to use ground quicklime, but it is indispensible to regulate the rate of its hydration. Also effective is the use of ground, unslaked, carbonate lime. In individual instances it is advantageous to incorporate, at the same time, both slaked and quicklime. During AT there are formed hydrosilicates of different degree of basicity, of different crystalline structure and containing different amounts of combined water. Under ordinary conditions of AT not all of the Ca-hydrosilicate has time to change into a crystalline form, for which reason it is necessary

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USSR /Chemical Technology. Chemical Products and Their Application I-12

Silicates. Glass. Ceramics. Binders.

Abs Jour: Referat Zhur - Khimiya, No 9, 1957, 31639

to speed up the processes of crystallization by increasing the pressure (optimum of the order of 12 atmospheres, gauge pressure); increasing the duration of the treatment, the more so, the lower the pressure; adding crystallization nuclei (substances containing, in crystalline form, the same compounds that are formed on AT), etc. In production of LSA an effective procedure is a fine grinding of a portion of the sand, or a coarse grinding of all of the sand; and in the production of cement articles, the same procedure is applied to the clinker portion of the binder. Too fine a comminution of the sand can have a

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USSR /Chemical Technology. Chemical Products and Their Application I-12

Silicates. Glass. Ceramics. Binders.

Abs Jour: Referat Zhur - Khimiya, No 9, 1957, 31639

detrimental effect. As crystallization nuclei, in the production of LSA, it is recommended to utilize ground silicate brick scrap.

Card 6/6

BUTT, YU. M

USSR/Chemical Technology. Chemical Products and Their Application - Silicates. Glass. Ceramics. Binders. I-9

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 12652

Author : Butt Yu.M., Rashkovich L.N.
Title : On Interaction of Portland Cement with Crystalline Silica on Autoclave Treatment

Orig Pub : Tsement, 1956, No 2, 21-26

Abstract : Presented are the results of investigations of the interaction of crystalline silica with basic minerals of Portland cement clinker, C_2S and C_3S, and also with Portland cements (P) of different mineralogical composition. It was found that durability of pure C_3S, steamed at 8 atm exceeds that of β -C_2S, steamed under the same conditions. At 16 atm the opposite result is obtained. On addition of sand > 10% and up to 60% durability of samples based on C_2S exceeds that of samples based on C_3S. It is noted that on steaming of P the

Card 1/2

YUNG, V.N., doktor tekhnicheskikh nauk, professor; BUTT, Yu.M., doktor tekhnicheskikh nauk, professor; MYSHLYAYEVA, V.V., kandidat tekhnicheskikh nauk.

Effect of alkalis on the properties of calcium silicate. TSement 17 no.6:9-13 N-D '56. (MLRA 9:8)
(Calcium silicates) (Alkalies)

BUTT, Yu.M.

Speeding up the process of autoclave hardening of cement products by introducing crystallic primers. Trudy MKHTI no.21:144-146 '56.
(Cement) (MLRA 9:9)

BUTT, YU. M.

USSR/Chemical Technology - Chemical Products and Their Application. Silicates. Glass. Ceramics. Binders, I-9

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 62384

Author: Yung, V. N., Butt, Yu. M., Neginskiy, M. S., Barbakadze, Ye. O.

Institution: None

Title: Attrition Resistance of Hydraulic Engineering Concrete

Original Periodical: Tr. Mosk. khim.-tekhnol. in-ta, 1956, No 21, 147-154

Abstract: A study of attrition resistance of concrete exposed to a flow of water carrying suspended rock particles. The experiments have shown that inclusion in the cement of hydraulic and microfiller additives lowers the resistance of concrete to attrition. Finer grinding of cement increases the resistance to attrition of concrete made therefrom. To obtain a concrete resistant to attrition it is important to take into account the hardness of aggregate particles. It is recommended to use as coarse aggregate in such a concrete crushed granite or other hard rock which must be subjected to preliminary

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USSR/Chemical Technology - Chemical Products and Their Application. Silicates. Glass. Ceramics. Binders, I-9

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 62384

Abstract: tests. Resistance to attrition of 1:2:3 concrete and 1:2.5 solutions made from the same cement is found on comparison to be 3 times higher in the case of concrete, within all of the investigated periods, and strength of concrete is 1.3 times greater. Increase of water/cement decreases resistance of concrete to attrition. On raising water-cement from 0.5 to 0.6 attrition wear of concrete increases by about 1.4 times. Addition of sulfite-alcohol liquor lowers water/cement and results therefore in an increased resistance of the concrete to attrition.

Card 2/2

Butt, Yu. M.

USSR/Chemical Technology - Chemical Products and Their Application. Silicates. Glass. Ceramics. Binders, I-9

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 62349

Author: Butt, Yu. M., Ayapov, U.

Institution: None

Title: On the Mechanism of the Effects of Lime on Hardening Process and Properties of Construction Gypsum

Original Periodical: Tr. Mosk. khim.-tekhnolog. in-ta, 1956, No 21, 162-173

Abstract: By petrographic, electron-microscopy, roentgenographic, thermographic and chemical methods an investigation was made of the effects produced by ground quicklime (L) on the properties of boiled and high-strength gypsum (G). Addition of L decreases thickness, retards setting, increases strength, water-resistance, impermeability and stability to cold weather of boiled G. Optimal addition of L is 5%. Addition of L to high-strength G has a detrimental effect. The beneficial effect of an addition of L to boiled G is due

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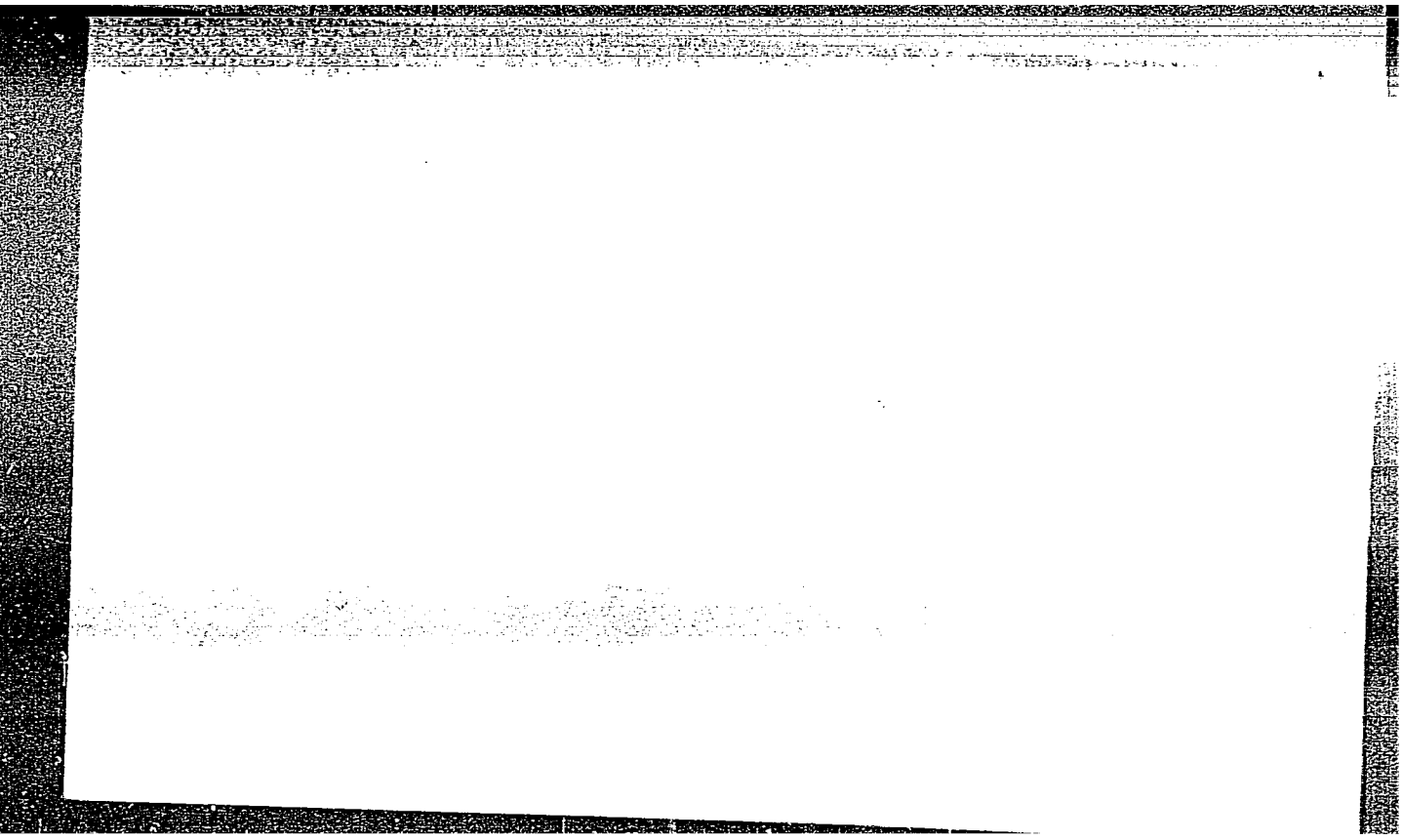
Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 62349

Abstract: to catalytic action of L on soluble (mostly) and insoluble anhydrides contained in commercial G and also to a decrease in thickness of the G which increases the density of the articles. An addition of L increases the rate of growth of G crystals and of the crystallization process which is due to increase in solubility of G semihydrate and decrease in solubility of G dihydrate. The greater the difference in solubilities of these 2 modifications of G the higher is the rate of dissolution of G semihydrate and also the rate of crystallization of G dihydrate from the liquid phase. Hydration of G semihydrate is slowed down on addition of L as a result of the formation of an adsorption layer at the surface of G grains, and at the same time addition of L promotes the growth of larger crystals of L-dihydrate.

Card 2/2



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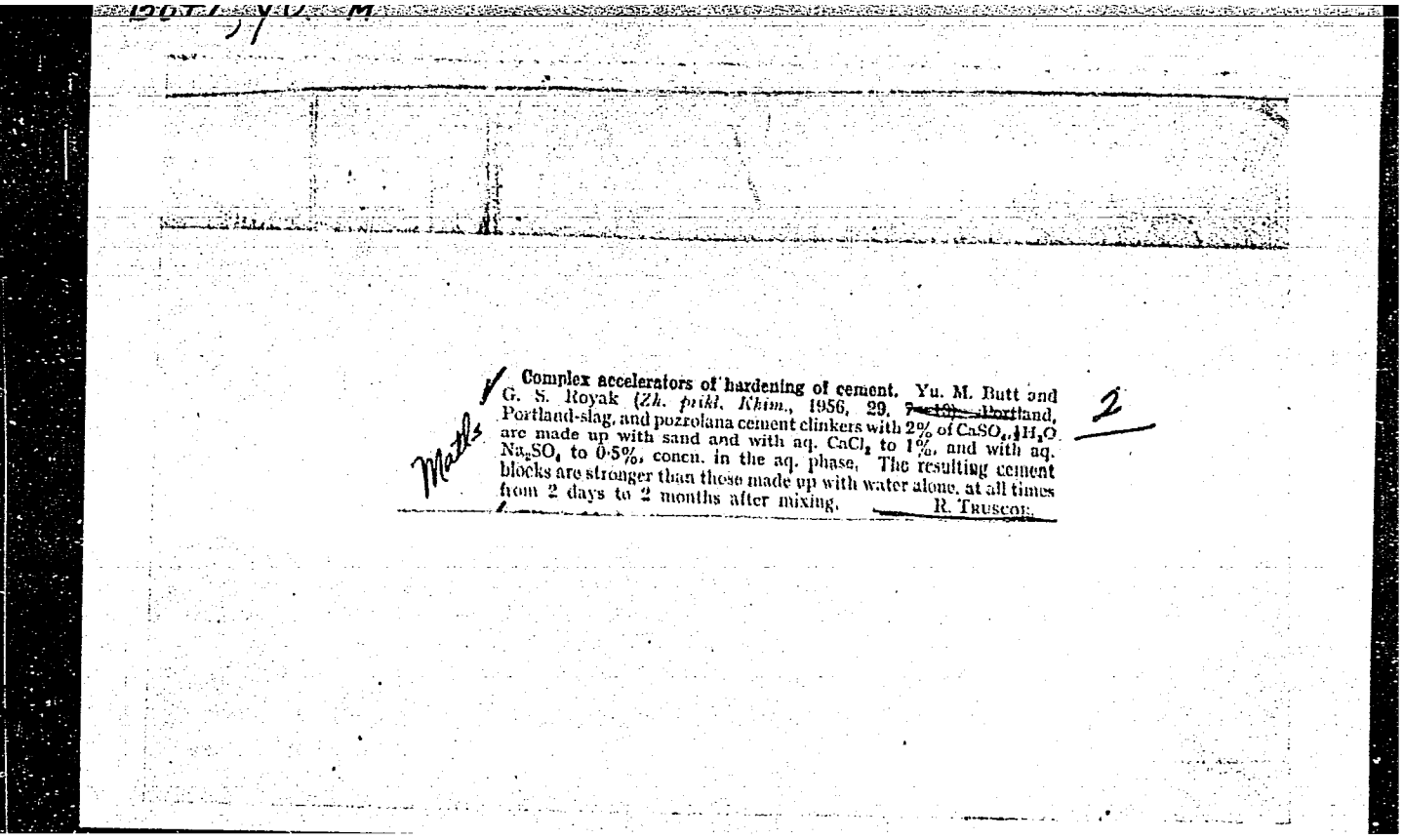
YUNG, V.N., doktor tekhnicheskikh nauk, professor; BUTT, Yu.M., doktor tekhnicheskikh nauk, professor; NEGINSKIY, M.S., kandidat tekhnicheskikh nauk; BARBAKADZE, Ye.O., inzhener.

Resistance of hydraulic engineering concretes to water attrition. Gidr. stroi. 25 no.4:34-38 My '56. (MLRA 9:9)
(Concrete) (Hydraulic engineering)



Maths

Complex accelerators of hardening of cement. Yu. M. Butt and G. S. Royak (*Zh. prikl. Khim.*, 1956, 29, 7–10).—Portland, Portland-slag, and pozzolana cement clinkers with 2% of $CaSO_4.\frac{1}{2}H_2O$, Na_2SO_4 to 0·5%, concn. in the aq. phase, The resulting cement are made up with sand and with aq. $CaCl_2$ to 1%, and with aq. blocks are stronger than these made up with water alone, at all times from 2 days to 2 months after mixing. R. TRUSCOTT.

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USSR/Chemical Technology - Chemical Products and Their Application. Silicates. Glass. Ceramics. Binders, I-9

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 62361

Author: Butt, Yu. M., Kolobov, Ye. M.

Institution: None

Title: Dependence of Cement Contraction Upon Its Mineralogical Composition

Original Periodical: Zh. prikl. khimii, 1956, 29, No 3, 468-470

Abstract: To establish a comparative qualitative contraction characteristic of the principal minerals of the clinker, tests were carried out with 4 cements prepared in the laboratory, each of which was characterized by predominance of some one mineral, and which approximated by their composition the single-mineral cements (alite, belite, aluminate, and alumoferrite). For comparison were tested laboratory ground cements from clinker of "Gigant" and "Komsomolets" cement plants. The experiments showed that the flux-minerals exhibit a much greater contraction effect than the silicate-minerals. On

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USSR/Chemical Technology - Chemical Products and Their Application. Silicates. Glass. Ceramics. Binders, I-9

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 62361

Abstract: addition of gypsum aluminate cement had a contraction in volume more than 2 times greater than on addition of Ca chloride. To obtain a dense cement stone of minimum microporosity caused by contraction it is preferable, with all other conditions being equal, to utilize Portland cement with a minimum content of flux.

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BUTT, YU. M

USSR/Chemical Technology - Chemical Products and Their Application. Silicates. Glass. Ceramics. Binders, I-9

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 62360

Author: Butt, Yu. M., Kolobov, Ye. M.

Institution: None

Title: Surface Strength of Cement Stone and Its Use as Frost-Resistance Characteristic

Original Periodical: Zh. prikl. khimii, 1956, 29, No 3, 470-473

Abstract: On determination of compression strength of cube specimens the stability of the entire structure of the specimen is tested since the load stress is taken up by the entire volume of the cube. Frost corrosion on the other hand affects first the corners then the edges and on the whole surface layers of all sides to a certain depth. Decrease in strength within these surface layers becomes distributed over the entire specimen which explains why evaluation of frost resistance from changes in compression strength is of

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USSR/Chemical Technology - Chemical Products and Their Application. Silicates. Glass. Ceramics. Binders, I-9

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 62360

Abstract: relatively low sensitivity. Hence it is of interest to measure strength of surface layers or the hardness for determining the frost resistance. The authors used a method analogous to that used to test hardness of metals. The investigations were carried out with clinker minerals and cement of the "Komsomolets" plant. Determinations of surface strength were made with unfrozen samples and samples subjected to 30 and 60 cycles of alternating freezing and thawing. The experiments showed that in the determination of frost resistance of cement stone the surface strength method is a sensitive method which reveals the essence of temperature and water induced weakening of the structure which starts at the surface of cement stone. Frost resistance of cements determined by this method under conditions of high saturation with water has shown that most stable among the tested specimens is belite cement and least stable alumoferrite cement. Surface strength or hardness of cement stone is a new accurate characteristic of the structure of microconcrete.

Card 2/2

Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 4, p 95 (USSR) 15-57-4-4657

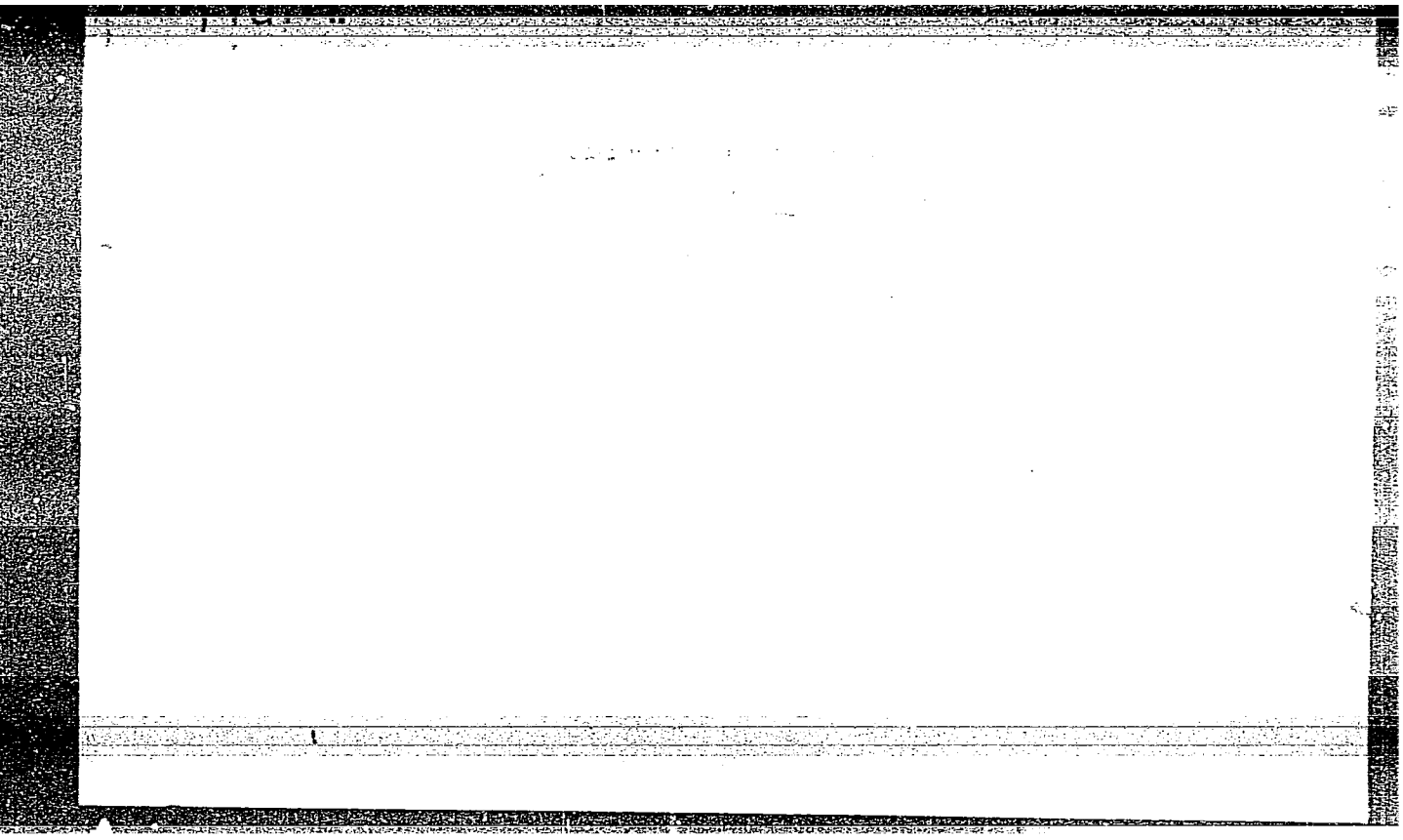
AUTHORS: Butt, Yu. M., Parimbegov, B.

TITLE: Influence of Hydrous Gypsum on the Properties of the Lime-Clay Materials Capable of Hydrothermal Hardening (Vliyaniye dvuvodnogo gipsa na svoystva izvestkovo-glinyanykh materialov gidrotermal'nogo tverdeniya)

PERIODICAL: Sb. tr. Resp. n.-i. in-t mestnykh stroit. materialov, 1956, Nr 10, pp 69-76.

ABSTRACT: Bibliographic entry

Card 1/1



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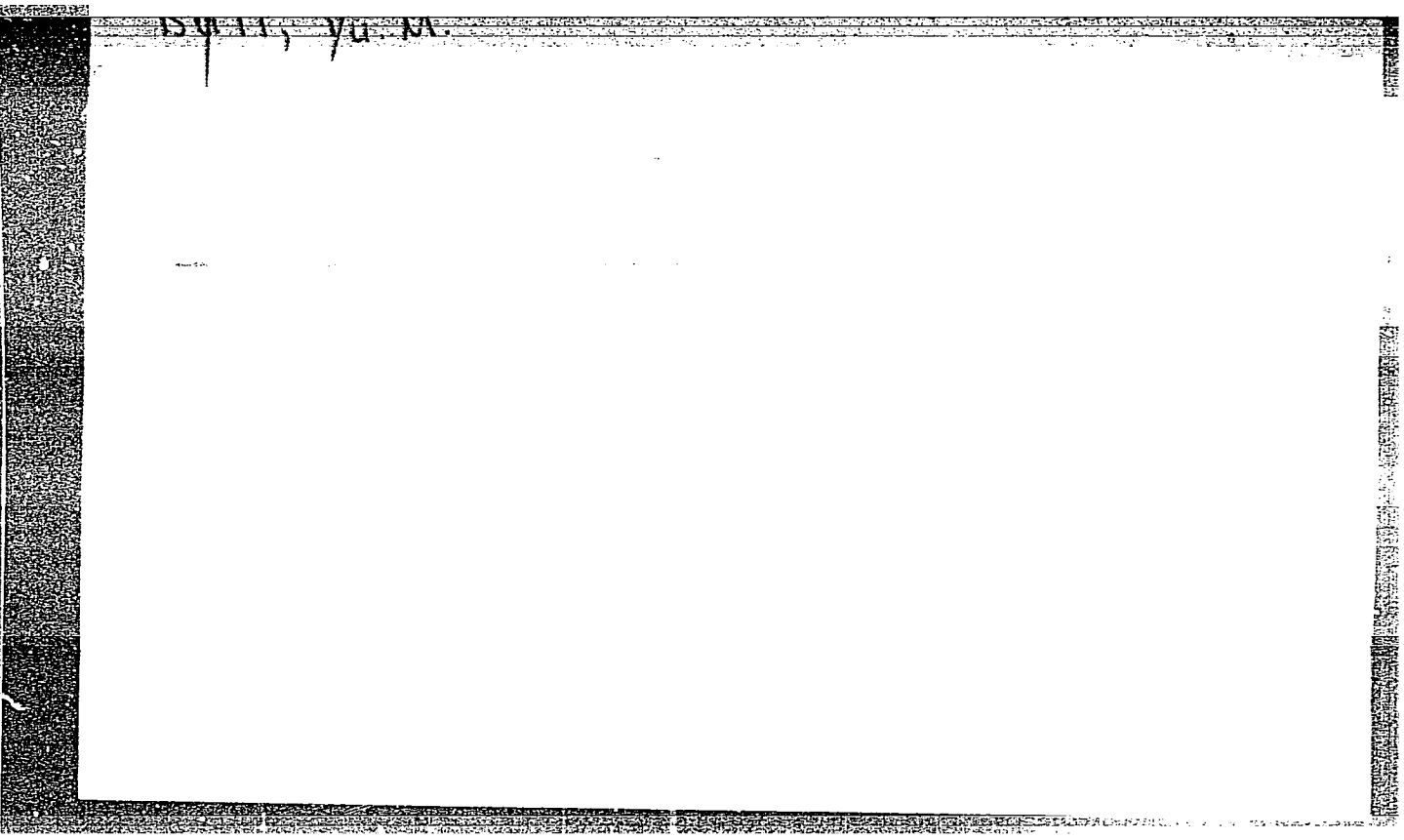

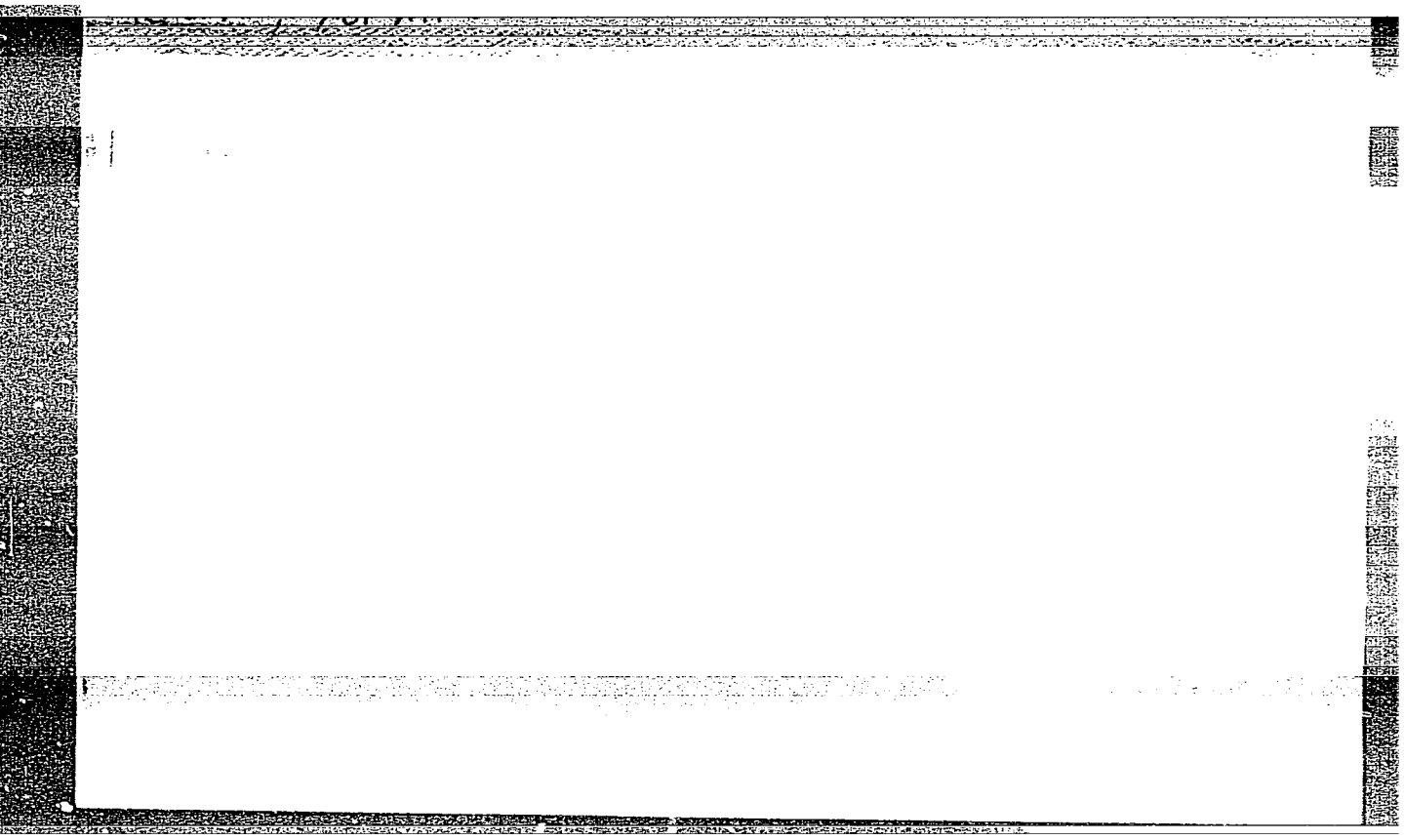

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USSR/Chemical Technology -- Chemical Products and Their Application. Silicates. Glass. Ceramics. Binders, I-9

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 1698

Author: Butt, Yu. M., Rashkovich, L. N., and Danilova, S. G.

Institution: Academy of Sciences USSR

Title: Reactions of Calcium Silicates with Silica During Hydrothermal Setting

Original Periodical: Dokl. AN SSSR, 1956, Vol 107, No 4, 571-574

Abstract: The mechanism of the interaction between C_2S and C_3S with sand during hydrothermal working is explained on the basis of thermal and chemical analyses as well as of strength tests. Samples prepared from C_2S and C_3S showed maximum strength when the content of hydrated calcium silicate (basicity 0.9) was at a maximum. The optimum amount of crystalline silica which must be added to produce a hydrated silicate of basicity 0.9 depends on the type of silicate, the type of autoclave process used, and of course, on the fineness of the silicate and of

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USSR/Chemical Technology -- Chemical Products and Their Application. Silicates. Glass. Ceramics. Binders, I-9

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 1698

Abstract: the sand. An increase in the pressure from 8 to 16 atm reduces the maximum strength of the samples and increases the optimum amount of sand required. The strength of the samples prepared from β-C_2S and sand (optimum quantity) is 2.5 times that of samples prepared from C_3S and sand. The authors are of the opinion that by varying the amount of sand and the conditions in the autoclave it is possible to produce concrete and ferroconcrete articles from belite clinker which equal in strength articles produced from alite cement.

Card 2/2

2108. Transactions of a conference on the use of vibration grinding in the building materials industry.—Yu. M. Butt, M. I. Gershman, and M. A. Matveev (Edited by) (Promstroiizdat, Moscow, 1957). In Russian. Transactions of a conference held in December 1955, in Moscow

p 3, T. P. Gvozdarev, "Achievements of Soviet technology in the ... grinding and its application in the manuf... tables.)

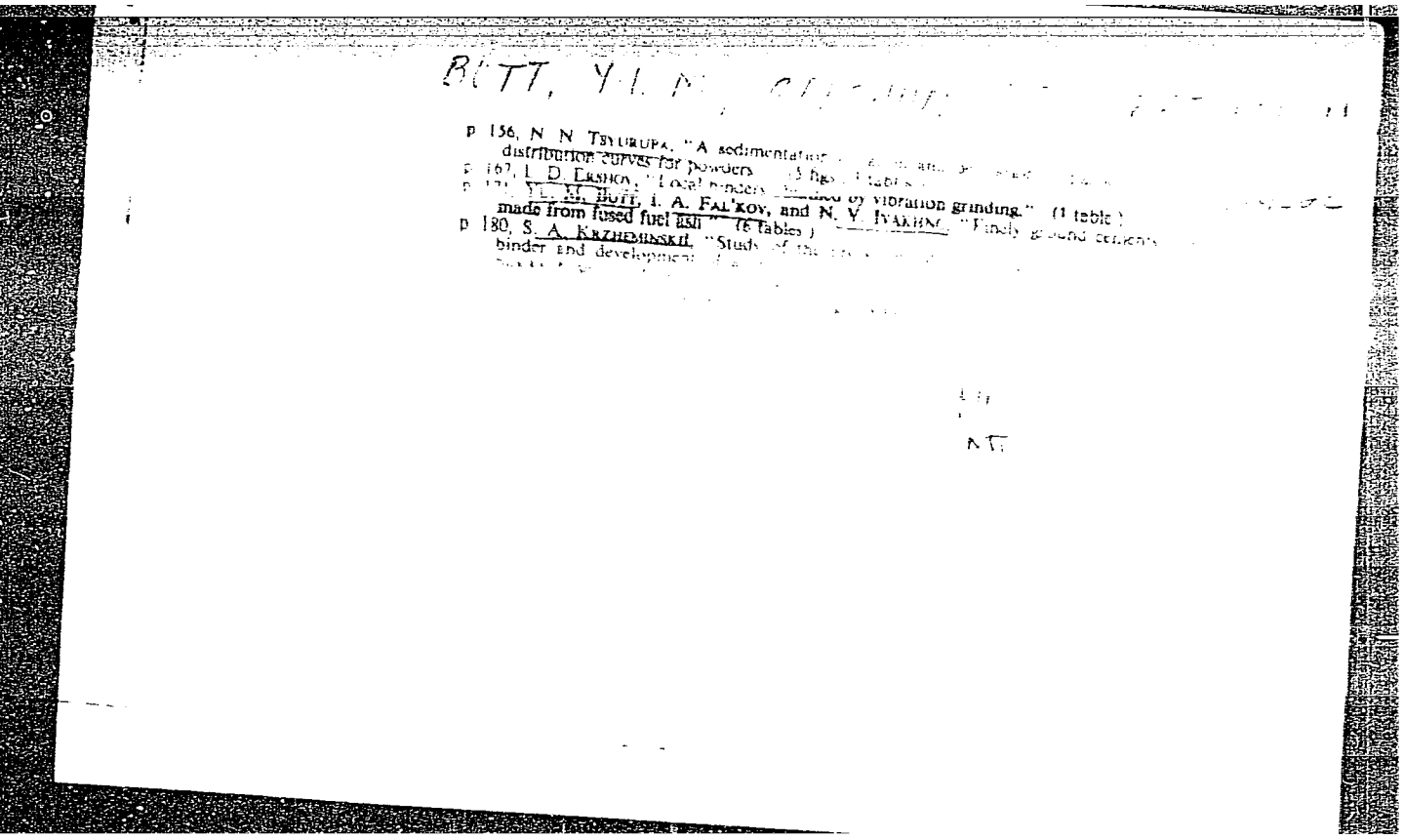
... Petrov, I. V. Shpakov, and P. G. Komokhov, "The ... grinding to obtain high-strength structural materials." (3 figs.)

p. 65, B. V. Deryagin, N. N. Zakhavaeva, and G. Ya. Vlasenko, "A critical review of methods for determining the specific surface of ground ... 7 tables.)

p. 90, V. V. Tikhanov ...

... figs., 3 tables.)

p. 131, K. S. Zaitsepin, "The manufacture of naturally hardening building ... based on vibration-grinding of lime."



BITT, Y. I.

p 156, N. N. TSYURUPA, "A sedimentation [illegible] distribution curves for powders." (3 figs, 1 table)
p 167, L. D. ERSHOV, "Local pressure [illegible]"
p 171, YE. M. BOTT, I. A. FAL'KOV, and N. V. IVANOV, "[illegible] of vibration grinding." (1 table)
p 180, S. A. KRZHEMINSKII, "Study of the [illegible] binder and development [illegible]" (6 tables)

"Finely ground cements made from fused fuel ash"

BUDNIKOV, P.P., red.; BUTT, Yu.M., red.; MATVEYEV, M.A., red.; TROKHIMOVSKAYA, I.P., red.; GURVICH, E.A., red.; GILENSON, P.G., tekhn.red.

[Collection of papers on the chemistry and technology of silicates] Sbornik turdov po khimii i tekhnologii silikatov. Moskva, Gos. izd-vo lit-ry po stroit. materialam, 1957. 424 p. (MIRA 11:3)
(Silicates)

BUTT, Yu. M., doktor tekhnicheskikh nauk; MAYER, A., kandidat tekhnicheskikh nauk

Interaction of quartz and lime in autoclave treatment. Stroi.mat. 3 no.2:32 F '57. (MLRA 10:3)
(Autoclaves) (Quartz) (Lime)

Butt, Yu. M.

BUTT, Yu.M., doktor tekhn. nauk, prof.; MYSHLYAYEVA, V.V., kand. tekhn. nauk; OSOKINA, T.A., inzh.

Effect of alkalis on the clinkering process and strength of the cement. TSement 23 no.5:9-14 S-O '57. (MIRA 11:1)
(Alkalies) (Cement--Testing)

BUTT, Yu.M.

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(Cement) (Calcium carbonate)
(Hydration)

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(Cement--Testing) (MIRA 11:6)